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A TRAGEDY OF THE GREAT PLAGUE OF MILAN IN 1630.

By Robert Fletcher, M. D.

In early Bible history there are records of the utter destruction of temples or even cities, the removal of every stone which marked their existence, and the sowing of the ground with salt, so that it might ever after be sterile. Of the efficacy of the latter part of the proceeding, some doubts might be entertained. In more modern times the residence of some notorious criminal has, in like manner, been destroyed and removed with the solemn declaration by the State that the ground upon which it had stood should be held as accursed, and that no building should ever be erected upon it. There are two noteworthy instances in which, in addition, a stone column with an inscription describing the crime and its punishment was erected upon the site of the dwelling of the criminal. The first in order of date is still in existence in Genoa. A certain Julius Cæsar Vacchero, known as the "richest merchant of Genoa," entered into a conspiracy in 1628 to destroy the republican government of Genoa and to deliver the State to the Duke of Savoy. He was beheaded with many of his fellow conspirators, his wife and children were banished, and by a decree of the Senate his palace was razed to the ground, every stone removed, and a pillar with an inscription devoting him to "eternal infamy" was erected on its site. A naval officer* who visited the spot a few years ago described to me the desolate appearance of this vast space of ground overgrown with brambles and weeds, with the weather-beaten stone pillar in its centre. In reply to his enquiries, no one could tell him anything of the story connected with the place, only that the ground was "accursed," and the pillar was "*colonna d'infamia.*"

The other column was erected in Milan, in 1630, and the tragedy it commemorated is the subject of the present sketch.

Traditions of the terrible pestilence known as the Black Death, which ravaged Europe in 1348, and which, according to estimates made from such sources as were accessible, swept away one-third of the inhabitants of the known world, were still rife in Milan when the great plague of 1630 broke out in that city. A writer has left a vivid description of the conditions brought about by the former visitation. He says:

*Captain Greer, now Rear Admiral Greer, U. S. N. (Retired). He copied the inscription, which corresponds exactly with that given in the account of Vacchero's conspiracy in the *Archivio storico d'Italia*, an important collection of public documents published by the Italian Government, and amounting to nearly a hundred volumes.

"Wild places were sought for shelter; some went into ships and anchored themselves afar off on the waters. But the angel that was pouring the vial had a foot on the sea as well as on the dry land. No place was so wild that the plague did not visit—none so secret that the quick-sighted pestilence did not discover—none could fly that it did not overtake.

"For a time all commerce was in coffins and shrouds, but even that ended. Shrift there was none; churches and chapels were open, but neither priests nor penitents entered—all went to the charnel-house. The sexton and the physician were cast into the same deep and wide grave; the testator, and his heirs and executors were hurled from the same cart into the same hole together. Fire became extinguished, as if its element had expired, and the seams of the sailorless ships yawned to the sun. Though doors were open and coffers unwatched, there was no theft; all offenses ceased, and no cry but the universal woe of the pestilence was heard among men."

There is nothing more cruel than fear, and no fear more debasing than that which is engendered by the presence or approach of a pestilence. We have not been without some experience of this in our own day, but when we add to this ignominious cowardice, the gross ignorance and superstition which existed at the period of which I am about to speak, we can understand, partly at least, how such a story became possible.

Manzoni, the famous Italian writer, the author of the best romance of the century in his language, "*I promessi sposi*," "The Betrothed," has told the story of this Milanese column in a small work published in 1840, *Storia della Colonna infame*. It has not been translated into English, though there is a French version of it.

The column in question was erected in 1630, and was blown down during a storm, in 1788. The inscription upon it was in Latin, which, in its construction, very closely resembles some portions of the inscription on the Genoese pillar. The literal translation of it is this:

"Here, where this plot of ground extends, formerly stood the shop of the barber Giangiacomo Mora, who had conspired with Guglielmo Piazza, Commissary of the Public Health, and with others, while a frightful plague exercised its ravages, by means of deadly ointments spread on all sides, to hurl many citizens to a cruel death. For this, the Senate, having declared them both to be enemies of their country, decreed that, placed on an elevated car, their flesh should be torn with red-hot pincers, their right hands be cut off, and their bones be broken; that they should be extended on the wheel, and at the end of six hours be put to death, and burnt. Then, and that there might remain no trace of these guilty men, their possessions should be sold at public sale, their ashes thrown into the river, and to perpetuate the memory of their deed the Senate wills that the house in which the crime was projected shall be razed to the ground, shall never be rebuilt, and that in its place a column shall be erected which shall be called Infamous. Keep afar off, then, afar off, good citizens, lest this accursed ground should pollute you with its infamy. August, 1630."

This barbarous sentence was executed in all its details, and for a hundred and fifty years, this pillar, intended to blast the memory of two really innocent persons, stood as the proof of the ignorance and credulity of their judges. In 1777, a certain Count Pietro Verri, Counsellor of State in the service of the Empress Maria Theresa, wrote a work, which, however, did not see the light until 1804, twenty-seven years later, entitled (translated) "Remarks upon torture, with special relation to the effects of the baleful ointments to which was attributed the plague which devastated Milan in the year 1630." Count Verri had carefully perused all the records of the trial of Piazza and Mora, and while pointing out the injustice done these wretched men, he decried in good set phrase the legalized use of torture. It is not surprising that he delayed the publication of his treatise. As late as 1768 the Empress Maria Theresa had authorized the publication of a codification of the laws relating to the use of torture by the courts. The judicial application of torture, or "the question," as it was termed by a delicate euphemism, comes down from the Roman code of laws. Count Verri quotes from the writings of many jurists as to the rights of the accused, and the power of the judges, in cases where it was necessary to extract the truth. The late Dr. Welling, of Washington, delivered an address on the law of torture, giving the codification of Guazzini, a famous Italian jurisconsult, which was published in 1612. There is a wonderful resemblance in the provisions of all these laws as described by Guazzini, Verri, and the later codification of Maria Theresa. Great discretion was given to the judges, but they were forbidden to apply the torture in any case more then three times. If the accused, appropriately named *l'afflitto*, the sufferer, bore these three administrations without confessing, then he was to be held guiltless as by Divine decision. In the "Ancient customs of Brittany," a very curious compilation made in 1330 and 1340, the same limitation was made, and if the accused bore it all without yielding, then he was to be, in the language of the compiler, "Safe and free, because it was evident that God exhibited miracles for him."

Another provision of the law regulating the application of torture, which was violated in the case in question, was that which forbids its use for the discovery of the *corpus delicti*, which must appear *aliunde*—from other sources—but only for the purpose of discovering the author and accomplices of the crime. Here there was certainly neither dead body nor injured person.

The preparation of the accused for the torture was ceremonious. It was a general belief of the times that an amulet or compact with the evil one which would enable him to endure the cruelest suffering, and thus evade the desired confession, might be concealed in his clothes, hair, or even in his stomach or bowels. His clothing was therefore changed, every particle of hair was shaved off, and a purgative was given him, so that he might be effectually deprived of all diabolic aid. Piazza was thus prepared every time that he was tortured.* The belief in this protective power was of ancient date. A distinguished Italian magistrate,† in a work on criminal law published in 1532, states that an accused man revealed the

* "Abraso prius dicto Gulielmo, et vestibus Curiæ induto, propinata etiam potione ea purgante." (Processo [etc.], p. 41.)

† Hippolytus de Marsiliis. Practica criminalis [etc.], fol., Venetiis, 1532, fol. 12.

secret of his ability to resist torture and refrain from cries or disclosures. He confessed that one of his relatives had prepared for him a cake of wheat flour, to which was added the mixed milk of a mother and daughter. Every day he was to swallow some crumbs of this cake, and as long as it lasted it insured his insensibility to torment. On the other hand, there were certain liquids and greases which, when rubbed into the body of an accused person, counteracted all his protective charms, and, says Marsiliis, with cynical exultation, "when that was done one could hear the joints crack and the bones sing." M. Le Blanc* says that these counter-charms were known in England in the 12th century, in Italy in the 14th century, and in China to quite recent days.†

The original account of the proceedings which led to the tragic end of Piazza and Mora is that of the Canon Ripamonti. He was born in 1577, and was historiographer of Milan. He published the first ten volumes of the Ecclesiastical History of Milan, in 1617, and by request of the Decurions wrote an account of the plague which devasted the city in 1630. This latter is a quarto book of 410 pages, written in Latin, and published at Milan in 1641. The title-page is a copper-plate engraving, curiously emblematic. There is a gigantic skeleton filling the entire page; his hands hold weapons, armor, and books of devotion; his bony feet protrude from under a carpet on which lies a man, the victim of the plague. In front of the skeleton is an altar with a crucifix, to which a woman, seated, with the usual naked boy attending her, points with a sword.

Two hundred years later, in 1841, this work was translated into Italian by Francesco Cusani, who has added many valuable notes in an appendix.

In 1839 the full official account of the trials of the "Anointers" was published in Milan.‡ It is in Italian, but all that relates to the application of the torture is discreetly veiled in the less familiar Latin, which, however, the modern editor has translated into Italian.

From these sources the facts have been obtained, now to be briefly presented.

Early in the morning of the 21st of June, 1630, during the prevalence of the plague in Milan, a woman of the lower classes saw from her window a man going down the street who was writing on a paper. He wiped his fingers on the wall of a house, probably to get rid of ink-stains, but with the readiness of ignorance and fear, she was sure that he was smearing deadly ointments to promote the spread of the pestilence. A crowd of excited women invaded the Council-chamber, and the Senate was informed of the occurrence. Orders were immediately given to trace out and arrest the guilty man.

It must seem strange to us that the rulers of a great city, even at that time, could have been so ignorant as to believe that such means could be productive of the pestilence, or that any man or men could desire to destroy their fellow-citizens, and risk their own lives besides. But extraordinary occurrences demanded extraordinary causes to account for them. The plague was attributed to hail, to the poisoning of the fountains by the Jews—to deadly ointments so placed that passers-by would touch them. It became dangerous for any one to touch walls or buildings. Ripamonti relates that three French travelers admiring the façade of a building, one of them touched the marble, and was immediately set upon by the mob and dragged half dead to the prison. An old man, 80 years of age, about to sit down on a bench in the church of San Antonio, wiped off the dust with his cloak. A woman cried out that he was anointing the benches, and even there, in the house of God, the worshippers beat and kicked the life out of the unfortunate man. Such was the spirit of the time.

The earliest notice, perhaps, of this belief in "Anointers" is to be found in the works of Guy de Chauliac, who was physician to Pope Clement VI and was living in Avignon, in 1348, when the Black Death ravaged that city. He says: "It was believed that the Jews had poisoned the world, for which reason they were slain. In other places they drove away beggars after cutting off their ears * * * and if it was found that any one had powders or ointments, he was compelled to swallow them, to show they were not poisons.*

Ambroise Paré, in his *Livre de la peste*, throws further light on the matter. In his Advice to Magistrates, during the visitation of the pestilence, he concludes the chapter thus:

"What shall I add? They must keep an eye on certain thieves, murderers, poisoners, worse than inhuman, who grease and smear the walls and doors of rich houses with matter from buboes and carbuncles, and other excretions of the plague-stricken, so as to infect the houses and thus be enabled to break into them, pillage and strip them, and even strangle the poor sick people in their beds; which was done at Lyons in the year 1565. God! what punishment such fellows deserve; but this I leave to the discretion of the Magistrates who have charge of such duties."†

The scrivener, with the ink-horn at his belt, was discovered, and proved to be a certain Guglielmo Piazza, a commissioner of health, a petty officer employed to report cases of the disease. He stoutly denied all knowledge of the crime charged to him, and maintained his resolution through two applications of torture, although the second one was the "question extraordinary," in which atrocious complications were added to the ordinary proceeding. But in his cell, broken down with the effects of the torments he had twice experienced, and dreading their renewal, which he knew would come, the unhappy man yielded to the insidious suggestions of those around him. He confessed his guilt, and declared that he obtained the death-dealing ointment from the barber Giangiacomo Mora. The latter was immediately arrested, but was likewise vehement in his declarations of innocence, avowing that he had never seen or known Piazza. The latter was made of sterner stuff than the barber, who yielded at the first application of

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* Le Blanc, (Edmond). De l'ancient croyance à des moyens secrets de défier la torture. Paris, 1892, p. 14.

† Bodin states that magic words conferring immunity under torture were sometimes written on the scalp of sorcerers, where it was concealed by the hair. (De la démonomanie des sorcières, 1587.)

‡ Processo originale degli Untori nella peste del 1630. Milan, 1839. 8°.

* Cyrurgica, 1499, fol. 19.

† Œuvres, 1575, fol., p. 662.

the torture, and confessed everything they suggested to him. From that time on these two wretched men vied with each other in manufacturing falsehoods. They implicated even a Count Padilla, the son of the Commandant of the Castle. He was arrested, but having powerful friends, his trial did not take place until long after the execution of Piazza and Mora. It was from the documentary evidence on his trial that Count Verri obtained the full details of the iniquitous treatment of the two victims who had perished. Count Padilla was ultimately acquitted.

Mora, the barber, had a wife and five children; the eldest, a young man, assisting him in his business. The latter was arrested with his father, and the entire contents of the shop were seized and carried to the court. As was usual in those days, the barber dabbled in medicine, and he declared, no doubt with truth, that the various pans and vessels contained remedies for or preservatives from the pest. The sale of these specifics was very extensive. A man who was hanged for robbery during the height of the pestilence confessed, with the rope around his neck, that he had prepared an ointment as a charm against the Anointers. Cusani, in his notes, gives the formula of what became known as Unguento dell' Impiccato, "The ointment of the hanged man." It may take its place with the "Vinegar of the four thieves," which had its origin during the plague of Marseilles. Its composition was supposed to be: Wax, 3 ounces; Olive oil, 2 ounces; Oil ivy, Oil stone, Leaves of Anethum, or dill, Laurel berries, Sage and Rosemary, of each ½ ounce. A little vinegar was added.

It is interesting to observe that these remedies, or preventatives, were composed almost entirely of aromatics, some of which furnish the accepted germicides of our own day. The apertures of the body were to be especially guarded by application of these waters or tinctures. Ambroise Paré recommends that a surgeon called to attend patients with the plague should first be purged and bled. Next he should have two issues made, one at the insertion of the deltoid of the right arm, and another about three fingers' breadth below the left knee. He considerately adds that these need not be made if the surgeon already has any running sore. "For truly," he declares, "we know from experience, that they who have such open sores, have not been subject to the plague, and have taken no harm, though they were every day among cases of it."*

Paré also gives a formula of a "Preservative water," with which the surgeon was to wash his whole body "very frequently," and he adds, "it is a good thing to wash the mouth with it, and draw a little of it up the nose, and put a few drops into the ear."

This preservative consisted of a mixture of rose water, elderflower water, and wine, in which were boiled, by slow heat, the roots of inula, angelica, gentian, bistort and zedoary; also the leaves of sage, rosemary, wormwood and rue; juniper and ivy berries with lemon peel, and the mystic theriac and mithridate were finally added.

As a proof of the danger of contact with the bodies of infected persons, Paré relates in his vivid style how he himself nearly fell a victim to a sudden deadly syncope, the result of the overpowering effluvia which arose from the buboes and carbuncles of a plague-patient, as he uncovered him. Upon regaining consciousness he sneezed violently ten or twelve times, so that his nose bled, and he attributes his escape to "virtue of the expulsive power of his brain, seeing that all his other faculties were dead for the time."*

The barber's acquaintance with Piazza seems to have been limited to occasional visits of the latter to his shop for the usual service of his trade, and they both stated that Mora had undertaken to prepare a pot of his "preservative" for his customer. On this slight foundation was built a superstructure of conspiracy for wholesale murder, by the never-failing power of torture. Once, in his agony, the wretched barber cried to his judges that if they would tell him what they wanted him to say, he would say it! He confessed everything that was insidiously suggested, such as that he had mixed foam from the mouths of those dead of the plague with his ointment, and then declared that Piazza, whose business took him among the dead bodies, had supplied him with the material.

In the account of the trial there is frequent allusion to the "purging the infamy" of the accused. A Roman law, given by Justinian,† provides that gladiators, slaves, and infamous persons like them, when called as witnesses, should be first put to the torture, so as to insure their telling the truth. In like manner, in the Italian laws regulating the legal application of torture, the accused person was declared to be "infamous," and his implication of others in his crime was not to be accepted as proof, unless he maintained his charge while subjected to torture. If he then reiterated his declaration he was said to have "purged his infamy," and his evidence was admitted. Piazza, as he involved others in his accusations, was, on each fresh occasion, tortured to "purge his infamy," and thus make his charges applicable. The degree of suffering inflicted upon him seems to have been much lighter than on other occasions. He had been promised immunity from his sentence by the Auditor of the Court if he made full confession, another instance of the treachery of these officials, for the Governor only could exercise such power.

More than once, Piazza and Mora recanted, and declared that their confessions were false, and uttered only in fear of further torments. A threat of another application of the question, and, above all, the hope that if no longer recalcitrant they might expect some mitigation of the horrible punishmen which had been decreed as their fate, soon reduced them to submission. They were in the hands of men who were destitute of pity. The plague was raging, and the populace, fierce and ignorant, demanded their victims. The Commandant of the Castle, the father of Count Padilla who had been accused of complicity in the alleged crime, demanded of the Court that the execution of the sentence on Piazza and Mora should be delayed in order that they might be confronted with his son and their accusations be met. The judge refused to accede to his request on the ground that "the people were clamorous."

* *Op. cit.*, 663.

* *Op. cit.*, p. 664.

† Digest, *lib.* XX, *tit.* V, *de testibus*, 1, 21.

LA SENTENZA DATA A QVELLI CHE HANNO AVELENATO MOLTE PERSONE IR MILANO L'AN. 1630

Riferito in Senato dal Magnifico Senator Monti Presidente del Magistrato della sanità ib Processo formato contro Guglielmo Piazza e Gio. Giacomo Mora li quali con onto pestifero hanno appestata la Città udito il Magnifico Presidente e raccolti i uoti de Padri il Senato con concorso in questa sentenza

Che li sopranominati Mora e Piazza posti sopra d'un Carro syno condotti al loco solito della Giustitia. Nelli andare ne luoghi one hanno delinquito syno tenaglhati Avanti la Barberia del Mora si tagli all'uno, et all'altro la mano dritta. Si pompino loro l'ossa al solito con la Róta la quale si leui in alto, et in quella uiui s'intreccino li loro corpi. Dopo sei hore si scannino, e subito li loro cadaueri si abbruscino e se ceneri si gettino in fiume. La casa del Mora si spiani et in quel largo si drizzi una Colonna la quale si chiami Infame et in essa si scriui il sutesso ne ad alcuno sia permesso mai piu riedificare detta casa. Si dia satisfatione a creditori di detta Casa de beni di condennati, e non bastando syno satisfatti del Publico. Li beni del detto Mora e Piazza si confischino

Hor. Colombo ex. Si stampano de rimpetto alla Minerva Rel. Coll. Rom.

DESCRITTIONE DELLA ESECVTIONE DI GIVSTITIA FATTA IN MILANO CONTRO QVELLI LI QVALI HANNO COMPOSTO E SPARSO GL'VNTI PESTIFERI

FIG. 1.

When the condemned men found that their examinations were at an end, and that, despite the promise of impunity, they were to be submitted to the full execution of their terrible sentence, they retracted in their confessions to the priest all the charges they had made against other persons, declaring that they were made under the agonies of torture, or in the apprehension of further suffering.

In the collection of medical portraits and engravings in the library of the Surgeon-General's office, at Washington, is an elaborate print, representing in all its details the execution of Piazza and Mora.

The engraving, which is from a copper-plate, is about sixteen inches square. It was published in Rome by the authority of the Nuncio of the Roman College. The engraver was Horatio Colombo. There is no date, but it is probable that it was brought out close upon the event it commemorates.*

The title on the top is (translated), "The sentence pronounced on those who had poisoned many persons in Milan in the year 1630." This is followed by the names of the Magnificos who sat in judgment, and the particulars of the punishment decreed. Each scene in the picture has its letter, which is referred to in an explanatory legend below. The entire disregard of the unities of time and place which characterized such productions is well displayed in this curious engraving. On the right is the shop of the barber Mora, and in front of it the "Column of Infamy" is already erected. A large platform car, drawn by two oxen, exhibits the victims, executioners, and priests. A brazier of live charcoal contains the pincers with which the flesh was to be torn. The barber's right hand is on the block, and a chopper held over the wrist is about to be struck down by a wooden mallet held aloft by the executioner. Further on is seen a large platform, on which the two victims are having their limbs broken by an iron bar, preparatory to their exposure on the wheel for six hours. The wheels are also displayed, one of them already on a pole, with the men bound upon it.

Still further on are the fires consuming the bodies, and, last scene of all, on the extreme left is a fussy little stream foaming under bridges, which is supposed to be a river, and into it a man is throwing the ashes of the two malefactors.

Comment upon this tragic occurrence is needless. It tells its own story and bears its own moral.

A few words may be added as to the mortality of this pestilence and the measures adopted by the authorities to encounter it. Like all statistics of those early times, the estimates are variable, but there are letters from the Sanitá to the Governor, which state the then daily mortality at 500. It is probable that the total number of deaths was about 150,000.

The tribunal of the Sanitá, a body something like a modern board of health, seem to have acted with sense and energy, though impeded by the obstinacy and ignorance of the Senate, the Council of Decurions and the Magistrates. To declare that the plague had appeared in Milan was to drive the people off, and to frighten trade away. The two physicians of the Sanitá, Taddino and Settala, scarcely dared to appear in the streets, and the latter, who was 80 years old, nearly lost his life from the angry mob. Later, when the existence of the pestilence had to be admitted, some strange precautions were adopted. An immense procession was to proceed through the city in honor of San Carlo and to implore his aid, and the authorities ordered the doors of all sequestered houses to be nailed up lest the distempered inmates should try to join the procession. There were 500 such houses, according to the Cavalier Somiglia, who also wrote an account of this fearful time.

Habit des Medecins, et autres personnes
qui visitent les Pestiferés, Il est de
marroquin de leuant, le masque a les yeux
de cristal, et un long nez rempli de parfums

Fig. 2.

An immense hospital was constructed to accommodate 2,000 persons, though at one time, in the height of the disease, the number of its patients had increased to 16,000. The pits dug for the dead became filled, and bodies in all stages of putrefaction were lying in houses and in the streets. In despair, the Sanitá applied to two priests who had been efficient in their aid. They promised that in four days all the corpses should be removed. They went into the country, and summoning the people in the name of religion, they succeeded in having three immense pits dug. The *monatti* of the Sanitá were employed to bring out the dead, and in the stipulated time the good fathers had fulfilled their pledge. The persons in the employ of the Sanitá for removing corpses were of three grades. The *monatti* carried the bodies out of the houses and carted them to the pits. The *apparitori*, or summoners (the name is still preserved in the English Ecclesiastical Courts as

* In the Processo originale degl' Untori, Milan, 1839, there is at the end a folding plate, which is a poor copy of this engraving. The editor speaks of the original as "una stampa di quel tempo."

apparitors) went before with a bell notifying the people to bring out their dead. The *commissari* were in control of the other two. It will be remembered that the unfortunate Piazza was a commissario.

Among the precautions taken by physicians for their own protection, while visiting plague-stricken patients, was the adoption of a particular dress. Paré recommends that the material should be camlet, serge, satin, taffeta, or morocco, but not cloth, frieze, or fur, lest these latter should harbor the poison, and death should be thus conveyed to the healthy. Manget, in his Traité de la peste (Genève, 1721, 2 vols.), has a frontispiece to the first volume representing the dress of a doctor during the plague at Marseilles. From his description it seems that the mantle, breeches, shirt, boots, gloves, and hat, were all of morocco leather. The beak attached to the mask was filled with aromatics, the air passing over them in respiration. Figure 2 is a reproduction of this plate from Manget's work. In a recent number of Janus (Amsterdam, 1897, p. 297), M. Reber gives an interesting account of an engraving in his possession, the work of the artist John Melchior Fuesslin, which also represents a doctor at Marseilles during the plague, and is, he thinks, of about the same date as the work of Manget. His engraving is herewith reproduced as Fig. 3. The legend underneath may be translated:

"Sketch of a Cordovan-leather-clad doctor of Marseilles, having also a nose-case filled with smoking material to keep off the plague. With the wand he is to feel the pulse."

In Manget's sketch the *Steklein* becomes a veritable stick, but the information conveyed by it would probably be quite as useful in the one case as in the other. The appearance of this leather-clad doctor, with his *nez fumant*, could scarcely have been reassuring to the plague-stricken wretch.

Since this address was written I have received the March number of the Bristol Medico-Chirurgical Journal, which contains a notice of the Manget and Reber sketches by Dr. L. M. Griffiths, the accomplished assistant editor. He reproduces the plates from the Janus blocks, and mentions that an amulet of arsenic was worn on the chest in time of plague, as a prophylactic, in the city of Bristol, as well as elsewhere. He quotes Kemp's treatise, 1665, thereanent. Ambroise Paré had, however, recommended this device a hundred years before. It was to be worn over the heart, in order that "the heart might become accustomed to poison, and so be the less injured when other poisons sought it."

SIR JOHN CHARLES BUCKNILL, M. D., F. R. C. P., F. R. S.*

By A. R. Urquhart, M. D., *Perth, Scotland.*

A notable personality has been lost to the medical profession by the death of Sir John Bucknill. During his long career of activity he worthily occupied a prominent position in the specialty of psychological medicine, giving forth no uncertain sound, and commanding respectful attention even from those who were most strenuously opposed to his utterances. He was a man of high ideals, fruitful in resources, indomitable in execution of what he conceived to be right. A masterful man, dealing shrewd blows, and unconscious of defeat.

Sir John Charles Bucknill was born at Market Bosworth, in Leicestershire, on the 25th December, 1817. His father, Mr. John Bucknill, practiced in that town as a surgeon. His younger brother, Alfred, who died at an early age, served in a regiment of the East India Company. He had two sisters, and a half-sister (by his father's second wife), who still survives.

Dr. Bucknill was educated at the grammar school of his native town, and at Rugby, under the great Dr. Arnold. In 1835 he entered University College, London; and, five years later, took the degree of Bachelor of Medicine, at London University. His career as a student was distinguished, and he served as house-surgeon under Liston, at University College Hospital, where Sir John Eric Erichsen and Sir Richard Quain were among his contemporaries.

After resigning that appointment, Dr. Bucknill began the practice of his profession in Chelsea, where he remained for four years. He married, in 1842, Mary Anne, the only child of Mr. Thomas Townsend, of Hill-Morton Manor, Warwickshire. By her he had three sons—Colonel Bucknill, late of the Royal Engineers; Mr. T. T. Bucknill, Q. C., M. P. for the Epsom Divison of Mid-Surrey; and Charles, now dead. Mrs. Bucknill died 1889.

His health having broken down, Dr. Bucknill was advised to live in a warmer climate; and this, no doubt, determined his application for the post of medical superintendent of the Devon County Asylum. He was appointed in 1844, and held office for eighteen years. The Devon County Asylum was designed on a system of radiating blocks, and expressed the latest improvements in construction at that time. Its first superintendent entered on his duties with characteristic energy and conspicuous ability, and soon organized it in accordance with his own ideas. The Committee of Management and the Commissioners in Lunacy were not slow to recognize that the institution had been placed in the front rank of hospitals for the insane. Dr. Bucknill was as active in the scientific duties of his office as he was in the administration of domestic details; while immersed in the study of medico-legal questions, and assiduous in journalistic work, at the same time he found leisure to occupy himself with the organization of the volunteers.

His literary work began in 1851, with a pamphlet on the *Classification and Treatment of Criminal Lunatics.* This was followed in 1852 by another on the *Law and Theory of Insanity.* Dr. Bucknill's first important book was published in 1854—"Unsoundness of Mind in Relation to Criminal Acts," being the first Sugden Prize Essay. It appeared again in a second

* Presented to the Johns Hopkins Hospital Medical Society, June 5, 1898.

Vbrig eines in Cordiuan-Leder bekleideten mit einem von Pest vertreibendem Rauchwerk angefüllten Nasen-Futer versehenen Doctors von Marseille. Der mit einem Stecklein den Puls soll fühlen.

Fig. 3.

edition in 1857. These studies showed the bent of Dr. Bucknill's mind, and to the last he maintained his interest in them, publishing papers on cognate subjects down to 1884. In the Sugden Prize Essay he clearly stated that "responsibility depends upon power, not upon knowledge, still less upon feeling. A man is responsible to do that which he can do, not that which he feels or knows it right to do." In process of time, this position is slowly but surely being assumed by the legal profession, and the difficulties which then embarrassed the administration of justice are now less formidable in practice.

The first number of the *Journal of Mental Science* appeared in 1853, under the title of *The Asylum Journal*. Dr. Damerow, of Halle, had suggested a periodical on similar lines, in 1844, in which year *The American Journal of Insanity* was brought out. He found an active supporter in Dr. Bucknill. The association of medical officers of Asylums and Hospitals for the Insane, at a meeting held in Oxford, in 1852, unanimously resolved to establish their journal, and to confide the editorial labors and responsibilities to Dr. Bucknill, who continued to edit it until 1862, when he was compelled to resign office on his appointment as Lord Chancellor's visitor. Reference to the early volumes will show how he labored to make the journal worthy of its high aims, and what success followed on his devotion to its interests. Year by year, each volume has been prefaced by his eloquent and stirring words, which still incite us "to pursue that knowledge which is to be obtained in the practical departments of science."

His literary abilities and sound judgment were soon recognized, and he became a frequent contributor to the *British and Foreign Medico-Chirurgical Review*, which was then at its zenith. He had the highest opinion of the value of that Review, and counted it an honor to be a contributor. His article on the *Pathology of Insanity*, in 1855, was the germ of his greatest work, in which he was associated with the late Dr. Hack Tuke. The "Manual of Psychological Medicine," published in 1858, at once became a standard authority, and ran through four editions, the last appearing in 1879. Dr. Bucknill's share of this volume comprised the eminently practical sections relating to Diagnosis, Pathology and Treatment. His ripened experience and careful observations betrayed no trace of fatigue, his delineations of disease showed the hand of a master.

In the more immediate duties of his office the same originality of thought and the same determination to advance were obvious. In 1859, the Commissioners in Lunacy reported in favorable terms of his treatment of patients in cottages beyond the immediate precincts of the asylum. The evolution of this method of care has proved successful beyond all question. From the modest cottages at Exminster to the full development of such institutions as Alt Scherbitz, or Toledo, is a far cry; but the tone is triumphant. I do not know if Dr. Bucknill anticipated such far-reaching issues when he laid his modest plans of home-like surroundings for the insane, but I do know that the issues of his plan for National Defense greatly surpassed the imaginings of his fertile brain. When he invited four gentlemen to dinner on the evening of the 27th January, 1852, for the purpose of considering the possibility of raising a corps of Rifle Volunteers in South Devon, he so appealed to men that their new-found interest caused them to enter on the project with heart and soul. The Earl Fortescue, then Lord Lieutenant of the county, received their communication favorably; the Government, through him, accepted their services; and from that small beginning arose the present volunteer force of the country, with a roll of 224,525 efficient men.

While still at Exminster, Dr. Bucknill proceeded to take the degree of M. D., London, and became a Fellow of University College in 1852. Seven years later he was admitted a Fellow of the Royal College of Physicians, where he subsequently served as Censor (1879-81) and as Lumleian Lecturer (1877).

In 1859 and 1860 he published works of more general interest—"The Psychology of Shakespeare," and "The Medical Knowledge of Shakespeare." These were well received, and a second edition of the latter, under the title of the "Mad Folk of Shakespeare," was produced in 1867.

On Dr. Bucknill's appointment as Lord Chancellor's visitor, in 1862, he came to London and resided in the corner house of Cleveland Square, formerly occupied by Lord Playfair. After a time he moved to Wingate street; and, later, to Hill-Morton Manor, where he turned his attention to farming, and served the county as a member of the committee of the Warwickshire Asylum, to which his first assistant, Dr. Parsey, had been appointed medical superintendent.

In 1876, Dr. Bucknill resigned his office under the Lord Chancellor, and began practice as a consulting physician in mental diseases. At the Leeds meeting of the British Medical Association, in the following year, he delivered a presidential address before the section of psychology, entitled *The Priest and the Physician*. It was a powerful oration, and at once recalled attention to one who had been but little before the world during his period of official seclusion. The wide knowledge of men and affairs which Dr. Bucknill had garnered was given forth with no unsparing hand. He delivered a warning message to his colleagues, in advising the mental physician to breathe the pure air of a rational life, for his own sake, and for the sake of his patients; and inculcated the the greater need of understanding incoherence and delusion, and sympathizing with morbid feeling. He uttered the prophetic caution that we should walk with prudence and circumspection in the well-trod paths of medical reticence, forbearance and wisdom. Turning to those clergymen who had, at that time, achieved notoriety in connection with the book entitled *The Priest in Absolution*, he disposed once for all of the attempt to establish an identity between sin and disease. From the assertion that the physician is a naturalist, the priest a supernaturalist, and that no sophistry can bridge the abyss between them, Dr. Bucknill developed arguments in support of his position. This renascence of Heinroth's theory of the common origin of insanity and sin was strangled in his powerful grasp.

About this time, Dr. Bucknill published two little books, which were received with much hostile criticism. He had travelled in the United States in 1875, and his account of "Asylums for the Insane in America" was issued in the following year. The echoes of that controversy have not yet died

away, and I have no wish to re-awaken them now. Dr. Bucknill was a strong man. He held strong opinions and expressed them forcibly. His adherence to the principles and practice of Conolly was most tenacious. Although, in the preparation of the *Manual of Psychological Medicine*, points of difference had arisen between him and his collaborator, Dr. Hack Tuke, these were not obviously stated. The vexed question of mechanical restraint was one of these. As is now well known, the latter never adopted the extreme opinions Dr. Bucknill entertained. No doubt, Conolly set an impress on the minds of those brought into contact with him, and fired their zeal in no common measure. I have heard Dr. Bucknill say that every asylum physician should read every word Conolly published, and in truth, reforms of magnitude are not to be carried through without that overwhelming sense of necessity which rouses public interest and sweeps resistance aside. The time for a drastic remedy had come. I believe, too, at this late date, when the reorganized, reconstructed asylums of America have attained a level of efficiency unsurpassed in any other country, and much evil has been atoned by ameliorated conditions, that the specialty can well afford to admit that Dr. Bucknill's caustic pen was not employed in vain.

As to the other brochure on "Habitual Drunkenness," there will be more difference of opinion. The advance of Socialistic legislation is consequent on the alteration of the political equation. The treatment of habitual drunkards, whether by way of "reformation" or by way of "cure," is in an unsatisfactory state. Proceeding on the dogma that drunkenness is not *per se* a crime, we are on the eve of receiving some enactment dealing with those who mingle inebriety with offenses against the law. It does not appear to us, who see so much of the devastation wrought by this vice, that the moiety of legislation in progress is sufficient; but it may be accepted as an instalment. At the same time, we who occupy no extreme position must admit that Dr. Bucknill's shrewd common sense did much to clear the atmosphere.

His strictures upon private asylums, and suggestions for radical alterations in the care of the insane, were published in 1880, as a reprint of articles which had appeared in the *British Medical Journal*. It was in this direction that Dr. Bucknill diverged most widely from his colleagues. The book is entitled "The Care of the Insane and their Legal Control," and presents opinions and arguments most forcibly expressed. In brief, Dr. Bucknill advocated the abolition of the Commissioners in Lunacy, and would have relegated their duties to the Local Government Board in the case of paupers, and to the Lord Chancellor's office in the case of those possessed of property. This was generally received as an impossible policy, and failed for want of general support. His attack on private asylums, however, has been followed by most untoward results. His demand that the insane should not be "confined as a profitable private business" would at a stroke abolish private treatment. In fact, he did not or would not recognize that every kind of arrangement should be available, and that under efficient supervision the fittest should survive. The state of matters in England, at present, is far from satisfactory, the amended law of lunacy having resulted in grave and increasing evils. The discussion of these would be out of place on this occasion, but any presentment of Dr. Bucknill which would omit reference to his honest opinions and strenuous advocacy of them after a long life of observation and debate, would be partial and misleading.

In April, 1878, the first number of "Brain" appeared. With Dr. Bucknill, Sir James Crichton-Browne, Dr. Ferrier and Dr. Hughlings-Jackson were associated as editors. It was felt that there was room for a journal devoted to neurology, and the brilliant success with which "Brain" began and has continued showed that Dr. Bucknill had rightly judged the necessities of the medical profession in this direction. He continued to share in the direction of this journal for nine years, until it was firmly established as the organ of the Neurological Society.

Later communications to the current periodicals may be mentioned: In 1881, an article on *Lord Chief Justice Cockburn*; in 1882, a paper on the *Responsibility of Guiteau*; in 1884, a lecture on the *Relation of Madness to Crime*.

Dr. Bucknill had many honors showered upon him. He was a member of the Athenæum and Garrick Clubs, a Fellow of the Royal Society, a Justice of Peace for the County of Warwick, and a Governor of Bethlem Hospital. But the crowning mark of distinction of his long and active life was the Knighthood bestowed upon him in 1894. He was then entertained at Exeter by a distinguished company, who met to do him honor, and there to unveil a memorial of the inauguration of the Volunteer Force, which is decorated with a medallion bust of Sir John Bucknill, and bears an appropriate inscription. The Duke of Cambridge, so long the head of the army, in the course of an admirable speech presented him with a scroll commemorative of the occasion, and spoke in high terms of his services.

Sir John Bucknill was a keen sportsman, fond of all outdoor sports, as became one who was possessed of a commanding presence and a robust frame. He was also interested in music and the graphic arts. In early life, he allied himself with Palmerston in politics, but gradually changed to a moderate conservative.

Sir John Bucknill died at Bournemouth, where he spent the last years of his life, on 20th July, 1897, and was buried at Clifton, or Dunsmore, near Rugby. The cause of death was disease of the kidneys and bladder, leading to septic absorption. A photogravure from the Exeter Memorial published in the *Journal of Medical Science* is here reproduced; and Sir John Bucknill's biography is now in preparation by his eldest son.

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MEDICAL FEES IN ANCIENT GREECE AND ROME.*

By Charles Carroll Bombaugh, A. M., M. D., *Baltimore, Md.*

Those who examine with curious interest the 199 surgical instruments found in 1819 in the Via Consularis in Pompeii, and preserved in the National Museum at Naples, or their counterparts recovered from excavations in Rome and collected by Professor Scalzi, will remember that that interest centres in their remote antiquity and in their actual use more than eighteen centuries ago. At the same time the attentive observer cannot forget that they were not originals or prototypes, for the archeologists tell us that twenty centuries before Pompeii was buried by the shower of ashes from Vesuvius, the ancient Egyptians covered the ceilings and walls of the temples at Tentyra, Karnac and Luxor with basso relievos representing surgical operations and the instruments employed, many of which are analogous to the instruments in use at the present day.

Horace says in one of his Odes that there were brave men living before Agamemnon, the Grecian commander. We may quite as confidently say that there were good physicians before Hippocrates. And so, the father of medicine, transcendent as he was, originative, constructive as he was, belonged, let us remember, to the family of the Asclepiadae, the hereditary physicians of Greece, and therefore enjoyed special educational advantages in preparation for his immortal work. Granting that he brought order and law and symmetry out of chaos, the materials must have been ready at hand, for we are assured that observations and descriptions of symptoms were already numerous, and were marked by much acuteness. Granting that we owe to him the conception of the oath which he transmitted to posterity, that the striking portraiture of the true physician which he drew for all time was the outcome of his own creative power, there must have been sources of inspiration behind and beyond. Granting the authorship of his treatise on fractures and luxations, the genuineness of which is conceded, there were expert bone-setters on the stage of action long before his day. The master spirits that sway the multitude do not leap into the arena full panoplied as Minerva sprang from the brain of Jove.

Whether the story of Esculapius comes from the Greek mythology, or whether it is of Oriental origin, it helps the historian to establish the existence of medical men as a separate class among the earliest communities. Such traditions show that as far back as legendary history goes there existed men who made disease and the healing art a special study, and derived their means of subsistence from the practice of their craft.

Let us turn for a moment from history to mythology, from narrative to fable, though perhaps one is as purely legendary as the other. According to the best authorities, the siege of Troy took place about twelve hundred years before the Christian era. Four hundred years later, *i. e.* eight hundred years B. C., Homer wrote the Iliad. One of the first points we note in Homer's account is that medicine in Greece was not subordinated to religion and made a function of the priesthood, as it was in Egypt and in Asiatic countries where the offices of the priest and the physician were combined in the same person. If ever exercised in Greece by religious impostors, it must have been secularized at a very early period. Whatever may have been the familiarity of the cultivated Greeks with domestic remedies and vulnerary herbs, a more advanced knowledge of medical and surgical treatment appears to have been an accomplishment of the heroes of the Iliad. Pope, in his Essay on the character of Homer, says that "the state of war in which Greece lived required a knowledge of the healing of wounds, and this might make him breed his princes, Achilles, Patroclus, Podalirius and Machaon, to the science. What Homer thus attributes to others he himself knew, and he has given us reason to believe not slightly, for if we consider his insight into the structure of the human body, it is so nice that he has been judged by some to have "wounded his heroes with too much science."

Dr. Payne of London, in his History of Medicine, says that "the Homeric heroes themselves are represented as having considerable skill in surgery, and as able to attend to ordinary wounds and injuries, but there is also a professional class represented by Machaon and Podalirius, the two sons of Asclepius, who are treated with great respect. It would appear, too, from the Ethiopis of Archinus (quoted by Welcker and Haeser) that the duties of those two were not precisely the same. Machaon's task was more especially to heal injuries, while Podalirius had received from his father the gift of

*Read before the Historical Club of the Johns Hopkins Hospital, May 9, 1898.

recognizing what was not visible to the eye. In other words, a rough indication of the separation of medicine and surgery."

Assuming that these medical officers were real characters, or, at least, that they were types or representatives of a professional class, it would be a matter of interest to learn what remuneration they received for their services during the ten years' siege of Troy. Let us hope, for the honor of the profession, that they were better paid than was Bernal, the physician of Christopher Columbus on his first voyage. For his seven months' detail for such duty Bernal received a sum equivalent to $37 of our money; that is to say, about seventeen cents a day. What Marco, the surgeon of the expedition, received, we are not told.

Hippocrates was in his prime about four hundred years B. C. Contemporaneous with the father of medicine was another Greek, Herodotus, who was called the "father of history." Herodotus traveled extensively in Asia, Africa and Southern Europe, and in his intercourse with the learned men of the day acquired a large fund of curious information. He refers briefly in his first book, Clio, to the rude beginnings of the medical art among the Assyrians, the Babylonians and the Persians, and the manner in which, in the absence of professional teachers, the facts of experience were accumulated and transmitted. He says: "Such as are diseased among them they carry into some public square; they have no professors of medicine, but the passengers in general interrogate the sick person concerning his malady; that if any person has either been afflicted with a similar disease himself, or seen its operation upon another, he may communicate the process by which his own recovery was effected, or by which, in any other instance, he knew the disease to be removed. No one may pass by the afflicted person in silence, or without inquiry into the nature of the complaint." A cynic might say that this sort of history repeats itself in our day in the gratuitous advice and the infallible formularies that are thrust upon the helpless invalid by officious busy-bodies.

In his second book, Euterpe (84), he points out the germs or rudimentary forms of specialism in medical practice, the limitation to certain specified diseases, or to the diseases of a simple organ or class. He says: "The art of medicine in Egypt is thus exercised: One physician is confined to the study and management of one disease; there are, of course, a great number who practice this art; some attend to disorders of the eyes; others to those of the head; some take care of the teeth; others are conversant with all diseases of the bowels; whilst many attend to the cure of maladies which are less conspicuous."

Not until we come to his third book, Thalia, does Herodotus give us a glimpse of the question of compensation, recompense, requital, fee, honorarium, *quid pro quo*. We are told that the governor of Sardis, a Persian named Oroetes, in a fit of maddening jealousy, conceived the atrocious design of encompassing the death of Polycrates of Samos. He sent a messenger to Polycrates to request a visit from him on some plausible pretext, and the latter, unsuspicious of harm, set sail with a retinue befitting his rank, including Democedes of Crotona, who was reputed to be the most skillful practitioner of his time. When opportunity offered, Polycrates was assassinated, but afterward, on learning the facts, King Darius, of Persia, ordered the execution of Oroetes. Soon after this occurrence Darius, in leaping from his horse, twisted his foot with so much violence as to occasion sprain and luxation of the ankle joint.

Herodotus says: "Having at his court some Egyptians, supposed to be the skillful of the medical profession, he trusted to their assistance. They, however, increased the evil by twisting and otherwise violently handling the parts affected; from the extreme pain which he endured the king passed seven days and as many nights without sleep. In this situation on the eighth day, some one ventured to recommend Democedes of Crotona, having heard of his reputation at Sardis. Darius immediately sent for him; he was discovered among the slaves of Oroetes, where he had been allowed to remain in neglect, and was brought to the king just as he was found, in chains and in rags. He at once applied such strong fomentations and soothing remedies as were used in the treatment of similar cases in Greece, and by these means Darius, who had despaired of ever recovering the entire use of his foot, was not only enabled to sleep, but in a short time was completely restored. In acknowledgment of his cure Darius presented him with two pairs of fetters of gold.

This is the first medical fee of which I find any distinct or specific record in profane history. As to its significance, or to its fitness as a mark of gratitude, we may leave both to inference or to conjecture. If a condition of enforced servitude was to continue, golden fetters would have been quite as irksome as shackles of a baser metal. Thereupon Democedes ventured to ask the king whether, in return for restoring him to health, he wished to double his calamity. This reference to two pairs or sets of fetters pleased the king so much that he sent him to the apartments of the women for his reward. The eunuchs who conducted him informed the women that this was the man who had restored the king to life. Accordingly, they took a jar of gold, filled it with gold coin, and presented it to him. But royal munificence went beyond this mark of regard. A sumptuous house was provided for Democedes at Susa; he was entertained at the king's own table; he was held in the highest estimation, and he was supplied with all that heart could wish except the restriction of not being able to return to Greece. In the course of time it happened that Atossa, daughter of Cyrus and wife of Darius, had a troublesome ulcer on her breast, for which she consulted Democedes. He told her that he was able to cure it, but exacted of her an oath that in return she should serve him in whatever he might require, which, he assured her, would not involve any dishonor. Atossa was cured by his skill, and, observant of her promise and of his instructions, she persuaded Darius, on some artful pretext, to undertake a military excursion to Greece, and to direct Democedes to accompany the expedition both as medical adviser and pilot. Darius directed him to take with him all of his valuables as presents for his father and his brethren, assuring him of gifts of greater value on his return. But the wily physician profited by the voyage to make his escape. To him, as to many another exile, there was no place like home. Moreover, he

had been sufficiently remunerated at home to take off the sharp edge of the Persian temptation.

We are told that in his day, in Greece, the usual fee paid to physicians for incidental visits was very small; in fact, not more than two groats, sixteen cents, or about one-thirtieth of the customary fee in England in our time, one guinea. But remember that it was usual at that remote period for municipalities to hire physicians by the year, and pay them out of the public funds for attendance upon the citizens. When Democedes lived in Ægina his services were engaged at the rate of one talent per annum, about $2000, as near as we can estimate with our limited knowledge of relative values. At Athens his salary from the city treasury was one hundred minae, about $2400. When he afterward fixed his residence at Samos, Polycrates allowed him a pension which, according to the Attic standard of values, amounted to about $2400. But of all special acknowledgments or expressions of gratitude, one reported by Pliny takes the lead. He tells us that Cleombrotus received one hundred talents for the care and recovery of King Antiochus. If the Attic talent of the standard of Alexander is meant, this would amount to £24,375; if the standard of the coins of the Ptolemies, it would amount to £39,375, over $156,000, a sum that seems incredible, and which remains unmatched among the bounties of royalty at the present day.

Every Greek city had not only one or more public medical men in the municipal service, whose duty it was to visit the sick in the city and suburbs, but there was also a large dispensary, *iatrium*, where the practitioner, aided by his pupils, held consultations, performed operations and distributed the needful medicines. Beds were reserved for patients who could not be removed, or for very serious cases. The rich being able to be cared for at home, those who needed the aid of the public dispensary were the poor. Yet in the state of society at that period, the isolated poor, those without patron and "without brothers," as the phrase went, meaning those who were not members of a society having a mutual benefit fund, were not numerous. But what poor there were, we are assured by historians, were faithfully attended to in accordance with the precept of Hippocrates. Inscriptions show that it was an obligation that was gracefully and generously fulfilled. One of these, found at Cos, is an honorary decree regarding a physician who during an epidemic had particularly distinguished himself by his devotion. Another inscription is a decree granting a crown of gold to Metrodorus, who, for twenty years a public physician, has saved many citizens, and now lives in poverty, having refused from them any fees.

Passing on to the Roman Empire, we note that, as Montaigne says in his Essays, "no Roman till Pliny's time had ever vouchsafed to practice physic; that office was only performed by Greeks." It should be added, however, that it was largely in the hands of the slaves of wealthy Roman masters. In the early days of the republic, when the Romans were absorbed in their wars of conquest, medical assistance could only be obtained from persons of servile rank, a fact which held the profession for a long time in disrepute. Nearly two centuries before the establishment of the empire a Greek doctor named Archagathos came and settled in Rome. As Duruy tells us, at first he was welcomed there and received the citizenship. He induced the Senate to apply the public money to the purchase of a house for him where he could treat surgical cases, his practice being limited to the treatment of fractures and dislocations, to amputations, and the dressing of wounds, ulcers and abscesses, internal maladies being left to quacks. For a time he was the fashion, and did a lucrative business, but his methods were so barbarous that he was eventually stigmatized with the epithet Carnifex (butcher). The elder Cato, who was noted for the acerbity of his temper, came out with a broadside against Greek doctors, winding up his denunciation by saying: "They make us pay dearly for obtaining our confidence, and poison us the more easily." Yet Cato himself made some pretension to medical knowledge, and wrote a book on domestic medicine. It was only a jumble of old women's remedies, however, and of such recipes as village sorcerers of later days might recommend.

As we approach the period of the establishment of the empire, or about the commencement of the Christian era, we find that the practice of medicine was still in the hands of the Greek physicians, but as Greece was then under the protectorate of Rome, they were treated with distinguished consideration. Pliny says "the medical art did not harmonize with Roman gravity," whatever that means. In order to attract the Greek physicians to Rome, Cæsar gave them the *jus Quiritium*, and afterward Augustus exempted them from taxation. They were allowed certain special privileges, which the physicians of our day who are by courtesy exempted from jury duty can appreciate. With these concessions, and the attraction of liberal fees from the luxuriously inclined Romans, they flocked from all parts of Greece, but those who were not Athenians, we are told, were obliged to borrow their idiom as well as their recipes from the big-wigs of Athens in order to obtain patronage. They spoke at Rome the language of Athens, just as the French doctors at Paris, in Molière's time, spoke the Latin language. As educated men, their society was welcomed by the rulers and statesmen of Rome. Artorius, for instance, was called the friend of Augustus; Asclapo was the friend of Cicero; Asclepiades was the friend of Crassus, the orator, and so on.

In the course of time Roman citizens became practitioners. Of the education necessary to qualify them for their duties we have no account; we only know that it was under the superintendence of the *archiatri*. This was a favored or superior class, the first physician bearing the title being Andromachus, the medical adviser of Nero. During the reign of Nero the *archiatri* were divided into two classes, the physicians of the different quarters of the city, *archiatri populares*, and the physicians of the palace, *archiatri palatini*. The former were assigned to the relief of the poor, and each city was provided with five, seven or ten, according to its size. Rome had fourteen, besides one for the vestal virgins and one for the gymnasia. The latter, the *sancti palatii*, were men of elevated social position, and of high rank, not only in the exercise of their profession, but as counsellor of the government. Both were paid salaries, and were allowed special immunities and exemptions. Later on, in the time of Hadrian and the Antonines, such concessions were made still more

liberal, and the chief *archiater* ranked as a vicegerent. While the *populares* were obliged to attend their poor patients gratis, they were allowed to receive fees from the rich. They were not appointed by the municipal authorities, but were elected by the people, and while their office was less honorable than that of the *palatini*, it was more lucrative. In the time of Vespasian they had a retiring pension.

With regard to the amount of their income, the students of Roman antiquities have not been able to furnish satisfactory data. We learn from Pliny that at the beginning of the imperial reign such eminent physicians as Albutius, Arruntius, Calpetanus, Cassius and Rubrius made 250,000 sesterces per annum, which is equivalent to £1950, or $9750. We also learn from Pliny that Quintus Stertinius, the favorite of the Emperor Claudius, was content with the honor of serving the the Emperor at the rate of 500,000 sesterces ($19,500) per annum, though his fame was such that he might have made 600,000 sesterces, or $23,500 in private practice. He and his brother, who received the same annual income from Claudius, left between them at their death, notwithstanding large sums they had spent in beautifying the city of Naples, the sum of 30,000,000 of sesterces, equal to $1,170,000.

Among the outward and visible manifestations of gratitude for restoration to health is one which is preserved to this day. Antonius Musa, the physician of Augustus, according to some accounts, effected a radical cure of an obstinate cutaneous affection. Other accounts state that he was instrumental in saving the life of the Emperor. Whatever the precise fact, Augustus had a statue made of Musa, which he placed among his family group of bronze and marble memorials as one of the highest honors he could bestow. To-day, in the Vatican, it retains its place among the clustered family of the Cæsars, but though it is the impersonation or counterfeit presentment of Antonius Musa, it was adopted centuries ago, and is still accepted as the emblem or symbol of Esculapius. In later days, when the Byzantine and Western sections of the empire were alienated, and when Justinian, who called himself defender of the faith, was emperor at Constantinople, there were two Eastern brothers who practiced medicine in Cilicia, named Damian and Cosmas—names that were afterward enrolled in the list of Christian martyrs. They were nicknamed Anargyri, literally, "without money," because they refused recompense for professional services. Whatever was forced upon them, in spite of their reluctance, they turned over to the church, and when they were fortunate enough to cure Justinian of a perilous disease, and he insisted upon a generous reward, they stipulated that he should build churches, which he did on a large scale, and with an enormous outlay of money, in gratitude for his recovery.

In reviewing medical progress under the empire we note frequent foreshadowings of the methods and usages of later times. There were specialists in considerable variety; there were female doctors (unlike Athens, where females were forbidden by law to practice); there were public dispensaries for the treatment of the poor; there were quacks not only among the lower orders of ignorance and presumption, but among men of high degree; there were doctors for the aristocratic set who made fat fees by humoring the caprice and the self-coddling of the valetudinarian, or by ministering to the distempered fancy of the *malade imaginaire*. Doctors signed their prescriptions, and of the seals or stamps which they used there are still in existence 150. There were also apothecaries, who gave advice behind the backs of medical practitioners as ours do, but they charged for their advice as well as their medicines. Then, as now, the instructor of classes of medical students received pay for tuition. This payment was called "minerval," but the term was eventually made more comprehensive, and included the fees paid by patients for attendance. We are warranted in the inference that in the case of some rich patients, the minerval was disproportionately large when measured by the insufficiency of the service rendered; it certainly gave free scope to Martial for his epigrammatic satire. Finally, there were periods in which overcrowding of the ranks remind us of the forcible remark of Addison in the *Spectator*: "I am troubled when I reflect how the profession of physic is overburdened with practitioners, and filled with multitudes of ingenious gentlemen who starve one another."

Medicine in its embryonic or rudimentary state eighteen or twenty centuries ago, and medicine in its present state of advancement and achievement, are as wide apart as the Poles. Yet running through the ages they present certain features in common, and not the least of these is the standing acknowledgment of the homely old maxim of St. Paul, "the laborer is worthy of his hire." But while mercenaries of the Paracelsus stripe, or gold-loving doctors of physic, like Chaucer's in the Canterbury Tales, have always abounded, yet from time immemorial to the present hour, foremost and uppermost is the spirit of self-sacrifice, of self-renunciation, that is ever ready to lighten the burden of sorrow, to lift the heavy and the weary weight of suffering, and to listen responsively to what Wordsworth calls "the still, sad music of humanity."

ENDOTHELIOMA OF THE CERVIX UTERI.

By Elizabeth Hurdon, M. D., *Assistant in Gynecology, Johns Hopkins University.*

The following case of endothelioma is of interest chiefly on account of the rarity of this variety of tumor in the cervix. While, according to Pick's investigations, a large percentage of all endothelial tumors are found in the female generative organs, they are for the most part situated in the ovary, and so far as I can discover but three cases have been described as occurring in the uterus, two of which belonged to the cervix, and we add a third. The first case was reported by Amann, Jr., in his work on neoplasms of the cervix. The patient was a multipara 31 years old. The tumor consisted of a connective-tissue stroma in which were numerous anastomosing cells, strands and masses which contained central lumina. They were

composed of large epithelial-like cells, and in the lumina were numerous leucocytes embedded in fibrin, but no red blood corpuscles were seen. Neither the epithelium lining the cervical canal, nor the gland epithelium showed any proliferation, and by means of serial sections the writer conclusively proved the absence of any relation between the cells of the neoplasm and the cervical epithelium. Amann considered the tumor to be a true endothelioma originating from the endothelium of the lymph vessels in the deeper portion of the cervical mucosa.

A similar tumor also originating in the endothelium of the lymph vessels has been described by Braetz. The patient was a nullipara 18 years old. Attached to the posterior cervical lip was a papillary tumor which macroscopically could not be differentiated from a carcinoma. This tumor also consisted of a somewhat scanty connective-tissue stroma in which were cell strands of various forms containing central lumina. At some points round cells embedded in fibrin were found in the lumina, but more sparingly than in Amann's case. The cervical glands were unaltered and the cylindrical epithelium intact and showed no proliferation.

Ziegler has recently adopted a new classification for the sarcomata which have an alveolar or organized structure. The term endothelioma is practically limited to the tumors which originate from the endothelial lining of the lymph spaces or vessels, and the tumors arising from blood vessels are designated angio-sarcomata, but he states that of the latter group those which come from the endothelium of the vessels may also be called endotheliomata.

It is possible, moreover, that many of the perivascular angio-sarcomata are lymphatic endotheliomata, as it is easily conceivable that the network or loops of lymph channels which surround the blood vessel may be the site of origin of such a growth. In the restricted sense, however, the term endothelioma is still applicable to the new growths of the cervix described by Amann and Braetz, and also to our case, as they all are apparently of lymphatic origin. The remaining case of endothelioma of the uterus described by Pick as occurring in the body is not so clearly of the same nature.

History of the case. Mrs. S. was admitted to Prof. Kelly's private sanatorium, November, 1896.

For about nine years the patient had suffered from attacks of severe pain in the side, radiating down into the bladder, which were supposed to be renal colic. There was no suspicion of pelvic disease until three weeks before admission, when a slight hæmorrhage occurred for the first time since the menopause ten years before. On examination the cervix was found to be hard and choked by a flat mass 2x2 cm., which at first sight looked like a polyp and was discolored and showed white patches on its surface. (The mass which was attached to both the anterior and posterior lips was excised, being too dense to yield to the sharp curette. Surprisingly little bleeding followed, but when the mass was dissected out to the vaginal vault the disease appeared to extend farther.) The uterine body was small, the cervical end being larger than the body. The ovaries appeared normal. The left broad ligament was free. The right side was held by a firm band. No nodules, however, were felt in the broad ligament. The uterus was freely movable.

Operation. After catheterizing the left ureter (the right catheter could not be inserted) abdominal hysterectomy was performed, special care being taken to enucleate the right broad ligament out to the pelvic wall and down to its floor. The most dangerous part of the enucleation was anteriorly, where the vesical peritoneum was pinned to the uterus by adhesions apparently dependent upon the extension of the growth to the base of the bladder. The bladder, however, was dissected free without injury. The uterus was removed with the upper part of the vagina, including extensive tissue at the base of the broad ligaments.

The patient died on the 15th day, apparently of sepsis. Unfortunately, no autopsy could be obtained.

It will be observed how slight the local manifestations were, compared with the advancement of the growth, which had extended beyond possibility of complete removal before the attention was directed to the pelvic organs. This rapidity of growth was also observed in the cases reported by Amann and Braetz. As autopsies were obtained in none of the cases, the tendency to metastasize cannot be determined.

Pathological report. Gyn.-Path. Nos. 1405 and 1442. Dec. 14, 1896.

The specimen consists of the uterus with its appendages. The uterus is 8x5x3 cm. and is smooth and glistening. The cervical portion is enlarged, measuring 4.5x3.5 cm. in diameter, and is markedly indurated. The external os is represented by a crater-like excavation 2.5x2 cm. in diameter, and 2 cm. in depth. The anterior lip has been eaten away and the posterior is thickened laterally, being 2 to 3 cm. in thickness. The floor of the excavation is corrugated and roughened, but there is no evidence of softening nor of friability. The mucous membrane of the upper part of the cervical canal is apparently unaltered, but the walls of the entire cervix and also of the lower segment of the body, particularly on the left side and posteriorly, are thickened and indurated, and on section present a dense fibrillated structure. The uterine cavity has a smooth mucous membrane. On the posterior wall, however, there is a small polypoid thickening, and springing from the centre of the anterior wall is a pedunculated flattened mushroom-like polyp 2 cm. in diameter. The appendages present nothing of interest.

Histological examination. The lower portion of the cervix is covered with stratified squamous epithelium, but on advancing inward toward the apex of the excavation, which macroscopically presented an eroded appearance, the surface is necrotic. Above the necrotic area the cervical canal is lined with normal cylindrical epithelium. The cervical glands are in a few places dilated, but on the whole are practically normal. Penetrating all portions of the cervix extending to the mucous membrane internally, involving the lower portion of the body, and laterally reaching the parametrial cellular tissue are myriads of tubules (Fig. I). These may be dilated to form large alveoli and show some branching, but as a rule they appear as narrow channels, round or oval spaces, or as strands of cells two or three layers thick. Many of the small spaces, and more especially the larger ones, are lined by one layer

of spindle-shaped cells, which resemble normal endothelium, and which in some places are so flat as to be scarcely recognizable. Others of the small spaces, and also some of the

FIG. I. Is a characteristic field, and shows the large and small round or irregular spaces lined by one or more layers of cells. Note the intimate relationship between the cells lining the cavities and the surrounding stroma; in no place do these cells tend to become separated from the wall. The stroma is composed of spindle-shaped cells.

large ones, are lined with one uniform layer of cuboidal cells, having oval, well-stained nuclei. In many places the cells have proliferated and the spaces are lined by two, three or

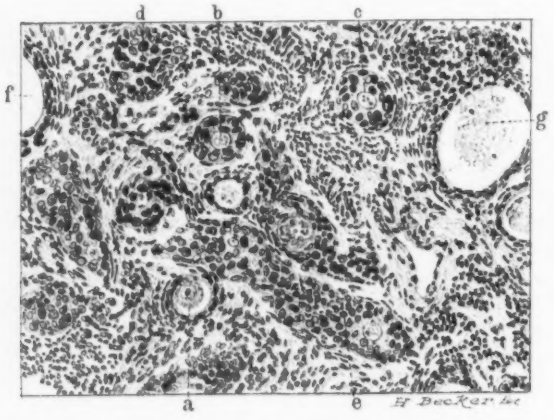

FIG. II. Shows the individual cell elements clearly; *a* represents a cavity lined by one layer of cells, which tend to become spindle-shaped; *b* and *c* are more advanced; the cells are several layers in thickness, and are gradually narrowing the lumen. At *d* a space has become completely filled, no cavity remaining, and *e* portrays a similar mass of cells on longitudinal section. At *f* the space is at one point lined by two layers of cells, a little further on by three layers; *g* is a good example of a dilated space, partially filled with granular material. Note in all these areas, especially *f* and *g*, the intimate relation between the stroma and the cells lining the spaces, also that there is no desquamation of cells. The stroma is, in places, abundantly infiltrated with small round cells.

more layers of cells, or again the cavity is completely obliterated and solid cylinders or nests of cells are formed (Fig. II).

Where several layers of cells are present they are usually larger and more spherical or cuboidal, but in general present more or less of their elongated form. Often a tubule is seen lined on one side with two or more layers of large roundish or oval cells, while on the opposite side is a single layer of flat, scarcely visible cells. In such instances the swollen cells are sometimes covered over with a layer of flat cells similar to those lining the opposite wall, thus suggesting a proliferation of the periendothelial cells. Again, a space lined with several layers of large cuboidal or oval cells merges directly into a narrow channel lined with one layer of endothelial-like cells and with difficulty distinguished from the small lymph or blood vessels near by. Surrounding many of the tubules is a narrow zone of hyaline giving the appearance of a sclerotic vessel wall. A notable feature of this tumor is the absence of any tendency on the part of the tumor cells to retract from the surrounding connective tissue, indicating the organic relation of the one to the other. This intimate connection is emphasized in many places by the imperceptible transition of the tumor cells into the connective tissue cells of the stroma. On the other hand, the epithelium of the glands and on the surface of the mucosa exhibits the usual tendency to separate from the underlying tissue. The surface epithelium is quite normal to the margin of the necrotic area, then gradually disappears, and although the mucosa is everywhere invaded by the new growth tubules or cell strands penetrating between the glands in close proximity to them and even encroaching upon the gland cavity, there is no metamorphosis of the epithelial cells into the cells of the tumor. It must be mentioned, however, that at one or two points where the growth reaches the surface there is at first sight an apparent relation between the epithelium and tumor cells, but on careful inspection it is seen that, although the epithelial cells are altered, they are of a quite different type from the cells of the neoplasm. The cell nuclei are large, vesicular, with finely granular or homogeneous character. The protoplasm is somewhat scanty, and it is generally impossible to differentiate the protoplasm of one cell from another. Where the cells are in several layers the nuclei are usually swollen and more faintly stained, scattered between these pale nuclei, however, are others which take an intense diffuse stain. Mitotic figures, both symmetrical and asymmetrical, and showing the various stages of division, are fairly abundant.

The majority of the tubules are empty, some, however, contain desquamated cells, a few small round cells, fragmented nuclei and shadows of cells. Sections from the tissue excised for diagnosis before the radical operation was performed, show fresh blood in many of the spaces, probably due to manipulation, as blood is not found in the tubules in sections from the organ which was removed entire. Careful search fails to reveal clumps of lymphoid cells in tubules, such as Braetz and Amann have described; serial sections, however, were not examined. Nevertheless, it is probable that this tumor has developed from the endothelium of the lymph spaces, a view supported by the general arrangement of the tubules which most frequently show a definite relation to the larger blood vessels. This is most characteristically shown in the deeper portions of the uterine walls, and in the parametrium, where the early

stages of the growth may be studied. The tissue is penetrated here and there by slender cords of cells, which usually contain central lumina, and present numerous ampullar spaces. Occasionally, larger solid cylinders of cells are seen. These cell strands are, for the most part, in the immediate vicinity of the blood vessels, sometimes apparently surrounding the vessel wall, again running parallel with it. Here and there wavy strands, consisting of one or two rows of spindle cells, suggest a transformation of connective issue rather than a tubular formation. At three or four points interesting pictures are seen, as represented in Fig. III. This is, apparently, a cross section of a nerve, which shows nests of tumor cells, evidently developing in lymph channels of the nerve sheath.

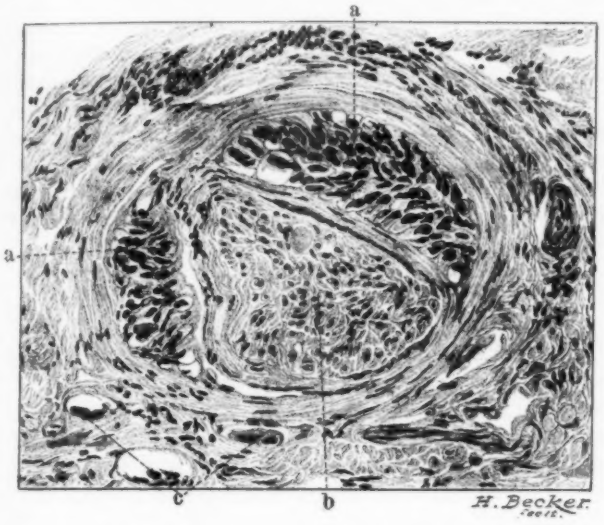

Fig. III. *b* is probably a cross section of a nerve, but a definite statement cannot be made, as further sections could not be obtained for special staining.

a and *a* are masses of tumor cells evidently in the lymph channels of the nerve sheath. A few tumor cells are also found at the point indicated by *c*.

The stroma of the tissue is abundant, is exceedingly dense, and consists, to a great extent, of normal cervical tissue. In the deeper portions there is considerable smooth muscle, and a moderate small round-celled infiltration. Blood vessels are fairly numerous and show marked obliterative endarteritis and arterio-sclerosis. The uterine mucosa is practically unaltered, and the polypi noted above consist of the normal elements of the uterine mucosa. The tubes and ovaries present the usual senile appearance.

This growth presents many characteristics differing from a carcinoma. It was peculiarly dense, even in the superficial portions, while in carcinomata the surface is easily curetted away. The only excresence consisted of a large flat polyp-like mass, with a regular outline, and there were none of the friable papillary outgrowths usually seen in carcinoma.

On histological examination, although there are points of similarity, yet the differences are marked. In the first place, the cervical glands, even in the older portions of the growth, appear normal, while in adeno-carcinoma they usually show cell proliferation and metamorphosis. Secondly, there are no tuft-like ingrowths of the cells, such as are so often seen in carcinoma. Thirdly, many of the spaces, both large and small, are lined with one layer of spindle cells. In adeno-carcinoma it is exceptional to find the epithelium spindle-shaped, and then only where the gland is distended and the epithelium has been flattened by pressure. The tubules in this case offer no evidence of pressure. The cells in general have their long axis running parallel with the circumference, and it is only rarely that cylindrical cells are found. Fourthly, the cells lining the tubules show no tendency to retract from their walls, but, on the contrary, there is an intimate relation between the tumor cells and the surrounding connective tissue, and where retraction of tissue has occurred, a few stroma cells accompany the cells lining the alveoli. In the case described by Braetz there was a sharp demarcation between the tumor cells and the stroma. Fifthly, although the tubules frequently anastomose, the tendency toward branching is not marked.

An arrangement especially emphasized by Braetz is in places observed in our case, that is that the tubules, particularly in the early stages of the growth, pursue a more or less parallel course.

Many of the tubules are surrounded by zones of hyaline, a condition which I have not noticed in adeno-carcinoma of the cervix.

Finally, the growth is widely distributed in the deeper tissues of the organ, the mucosa lining the upper portion of the cervical canal and the uterine cavity being practically free from extension of the growth, while the entire cervical walls and the lower third of the muscular coats of the body are everywhere invaded, and the parametrium is also involved. The extension is always apparently by direct continuity, and not by metastasis.

We are, therefore, dealing with a new growth, characterized by the formation of tubules and cell strands which follow the course of the blood vessels. The cells of the growth, moreover, show a definite relation to the surrounding stroma cells, while the epithelial elements of the tissue are practically normal.

In conclusion I wish to express my hearty thanks to Dr. Kelly for allowing me to report this unusual case.

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DESCRIPTION OF THE JOHNS HOPKINS HOSPITAL.

By John S. Billings, M. D., LL. D.

Containing 56 large quarto plates, phototypes, and lithographs, with views, plans and detail drawings of all buildings, and their interior arrangements—also wood-cuts of apparatus and fixtures; also 116 pages of letter-press describing the plans followed in the construction, and giving full details of heating-apparatus, ventilation, sewerage and plumbing. Price, bound in cloth, $7.50.

ON THE SPECIFIC GRAVITY OF THE URINE DURING ANÆSTHESIA AND AFTER SALT-SOLUTION ENEMATA.

By Thomas R. Brown, M. D., *The Johns Hopkins Hospital.*

Although it is known that under certain conditions a decrease in the specific gravity of the urine is seen, as notably in conditions of hysteria and neurasthenia, yet it is difficult to obtain definite information regarding the amount of this diminution; and to determine the exact decrease under certain conditions has been the object of this investigation, which was undertaken at the suggestion of Dr. Howard A. Kelly.

I.—During Ether Anæsthetization. (*See Chart I.*)

The first series of experiments, twenty-five in number, were carried on in the Gynecological Operating Room of the Johns Hopkins Hospital, and were designed to study the effect of ether anæsthesia upon the urinary specific gravity. The instrument used was the ordinary urinometer, tested and found to be accurate before the commencement of the experiments. In these cases from thirty to fifty minutes usually elapsed from the beginning of the administration of the narcotic to the catheterization of the urethra and the emptying of the bladder just before the commencement of the operation. As the patients had not been catheterizated *immediately* preceding the anæsthetization, there was presumably present in the bladder a certain quantity of urine. In most cases, however, this was very small, as either catheterization or natural voiding had taken place recently, and the urine was not in sufficient quantity to affect very materially the result.

In certain cases, however (cases VI, IX, XVIII, XXI, XXIII), the amount of urine present in the bladder was so great—as evidenced by the fact that by catheterization thirty minutes later, from two to five hundred cubic centimeters were obtained—that the comparatively small quantity secreted during anæsthesia had but little effect upon the specific gravity, and we had for examination urine differing but slightly from the normal urine of the patient, the specific gravity of which was decreased but slightly below the average of that especial case, and the color of which differed but slightly from that of normal urine.

In the remaining twenty cases, on the other hand, the quantity obtained was small, varying between thirty and one hundred cubic centimeters, probably a large part of which was secreted during the administration of the ether. In these cases the urine appeared quite differently; the color varied from a pale straw to that of water barely tinged, and the examination of the specific gravity showed that there was a marked decrease, from 1.0177 (the average of the average specific gravities of the urines of the twenty cases taken on several occasions previous and subsequent to the operation) to 1.066, the average specific gravity of the urines after the administration of ether.

In one of the cases the specific gravity of the just catheterized specimen of urine, *i. e.* at the body temperature, was .999, though on being allowed to stand until it acquired the temperature of the room, at which all the specific gravities were determined, it rose to 1.002. It will thus be seen that one of the effects of ether narcosis is a marked diminution in the urinary specific gravity, and that this is not a typical hydruria can be concluded from the fact that the quantity of urine secreted was not large, being no more than one would expect within the thirty to fifty minutes occupied in the administration of the narcotic.

From this it can be surmised that the effect of the ether upon the kidneys is to diminish markedly the secretion of the solid constituents, while the elimination of water is, in a certain number of cases at least, not so markedly affected. It is of interest, however, to note that in some cases the quantity obtainable was very small—less than ten cubic centimeters, and in these cases, evidently, water-elimination as well as solid constituent-excretion has been very much decreased. It was impossible in this investigation to draw any conclusions regarding the rôle played by the nervous element, as the decrease in the specific gravity was quite as marked in those who took the ether with a stoical calm as in especially neurotic patients.

II.—After Normal Salt-Solution Enemata. (*See Chart II.*)

The second series of experiments—ten in number—were designed to determine the effect of enemata of normal salt solution upon the specific gravity of the urine.

The method employed was as follows: the patient, immediately after voiding urine, was given five hundred cubic centimeters of normal salt solution through a rectal tube passed as far up as possible. In all but one of the cases this quantity was easily retained and caused the patient no discomfort. The patient was not allowed to drink water or any other fluid during the next four hours, and during this period the urine passed was carefully collected. In some cases urine was voided but once, in other cases twice during the four hours, but in them all between two hundred and fifty and four hundred cubic centimeters were voided, *i. e.* between one-half and four-fifths of the quantity given by rectum. The specific gravity fell markedly in all cases, the average fall being .008, from 1.016, the average specific gravity of the urines of the ten cases (each taken several times previously) to 1.008, the average of the specific gravities of the urines voided within four hours from the time the enemata were given. The color of the urine in these cases was exceedingly pale. These cases are in all probability true cases of hydruria, where the diminution in specific gravity is due not to a decreased excretion of solid constituents, but to a marked increase in the elimination of water. While the first series of experiments are of more interest from a scientific standpoint, the second series, showing as they do such rapid elimination of water with decreased specific gravity, suggest the possibility of giving rectal enemata of normal salt solution or water, to increase the flow of urine, and thereby probably to stimulate diuresis in some affections of the kidney, and as a method of internal irrigation, as it were, in some cases of cystitis.

CHART I.

SHOWING THE EFFECT OF ANÆSTHETIZATION UPON THE SPECIFIC GRAVITY OF THE URINE.

Case.	Average sp. gr.	Sp. gr. after anæsthesia.	REMARKS.
I	1.015	1.006	
II	1.020	1.005	
III	1.015	1.004	
IV	1.022	1.007	
V	1.012	1.010	
VI	1.021	1.015	Very large amount of dark-colored urine in bladder.
VII	1.019	1.002	
VIII	1.015	1.007	
IX	1.026	1.018	Large quantity of deeply pigmented urine in bladder.
X	1.025	1.009	
XI	1.022	1.002	
XII	1.022	1.003	
XIII	1.020	1.005	
XIV	1.020	1.010	
XV	1.013	1.008	
XVI	1.008	1.011	
XVII	1.028	1.018	
XVIII	1.018	1.017	Large amount of dark-colored urine in bladder.
XIX	1.013	1.005	
XX	1.018	1.005	
XXI	1.022	1.021	Large amount of dark-colored urine in bladder.
XXII	1.023	1.006	
XXIII	1.022	1.020	Large amount of dark-colored urine in bladder.
XXIV	1.012	1.009	
XXV	1.012	1.010	

Average of av. sp. grs. of the 25 cases.	Average of the sp. gr. after anæsthesia of the 25 cases.
1.01852	1.00932

Average of average sp.grs. of all cases except VI, IX, XVIII, XXI, XXIII.	Average of sp. gr. after anæsthesia of of all cases except VI, IX, XVIII, XXI, XXIII.
1.0177	1.00665

CHART II.

SHOWING THE EFFECT OF SALT-SOLUTION ENEMATA UPON THE SPECIFIC GRAVITY OF THE URINE.

Case.	Average sp. gr.	Sp. gr. of 1st specimen voided after enema.	Sp. gr. of 2nd specimen voided after enema.	Sp. gr. of urine voided under 4 hrs. after enema was given.
I	1.015	1.005	1.009	1.007
II	1.021	1.012	1.010	1.011
III	1.015	1.007	....	1.007
IV	1.012	1.008	1.006	1.007
V	1.014	1.008	1.005	1.006
VI	1.019	1.010	1.012	1.011
VII	1.014	1.006	....	1.006
VIII	1.018	1.008	1.008	1.008
IX	1.014	1.005	1.007	1.006
X	1.020	1.013	1.012	1.012

Average of average sp. grs. of the 10 cases.	Average sp. gr. of the 1st voided specimens of the 10 cases.	Average sp. gr. of 2nd voided specimens of the 10 cases.	Average sp. gr. of urine voided within 4 hrs. after giving of enema in the 10 cases.
1.0162	1.0083	1.0086	1.0081

CORRESPONDENCE.

HYDRAULIC PRESSURE IN BLADDER CONTRACTURE.

To the Editor:—It is but voicing the sentiment of the profession, I am confident, to say that all engaged in genito-urinary work are under obligations to Dr. Hugh H. Young for his exquisite study of hydraulic pressure in contracture of the bladder. (JOHNS HOPKINS HOSPITAL BULLETIN, May, 1898.) The value of "vesical gymnastics" to overcome this distressing trouble is emphasized by Dr. Young's article in your May issue, whose perusal I, as I think all teachers of genito-urinary diseases should, heartily recommend to my students.

There are, however, a few details in the article to which I must take exception.

The author employs a nozzle "somewhat similar to those devised by Janet and Valentine." The illustration shows that the nozzle is that of Janet, with two bulbs instead of one. For easy removal from the rubber tube and replacement, I have done away with the bulbs entirely; otherwise Dr. Young's nozzle is exactly like my sharp nozzle, which serves all purposes in the majority of cases. But there are men whose meatus is too large or too small for the sharp nozzle; for those the dome-shaped or flat-topped nozzle is required.

The author says (page 108): "Valentine's complicated nozzle and stop-cock are unnecessary." It would seem from the illustration upon page 109 that a much more complicated apparatus is necessary.

I assume that the author has been imposed upon by some unscrupulous manufacturer, who palmed off an alleged "Valentine Irrigator" for the simple device whose description appears in the *Medical Record* for April 16th, 1898, and which I had the honor of first demonstrating at the Hospital Nécker (Paris) on September 15th, 1897. The principal advantages of this apparatus are:

1. That it requires no change of elevation for irrigating the anterior urethra, the posterior urethra and the bladder;

2. The variations in hydraulic pressure are easily procured by a slight motion of the operator's thumb;

3. Nearly every patient can be irrigated while sitting on a chair; most can urinate without rising, while Dr. Young's apparatus required that the patients are irrigated while lying down. This entails getting from the table and clambering up again for a second or third irrigation;

4. Greater cleanliness, for the simple metal shield which is part of the stop-cock catches the fluid that spurts from the urethra and diverts it into the basin held by the patient. Neither the penis, scrotum or nates of the patient, nor the operator's fingers, save the third and fourth of his left hand, are even moistened by an irrigation.

Still, I must agree with the author that no apparatus beyond a rubber tube is necessary for urethral or intravesical irrigations, provided the operator has the skill which experience gives, to wash the urethra and fill the bladder without even the aid of a nozzle. Yet for convenience and cleanliness, as well as for economy, the majority of the profession use the irrigator I devised.

I am preparing a new article on urethral and intravesical irrigations, in which I shall endeavor to more fully set forth the ideas suggested above. Very truly yours,

FERD. C. VALENTINE,
242 West 43rd Street, New York.

[In reply to Dr. Valentine, I will simply state that although I had the nozzle in question made several years ago, long before I saw the subsequent publications of himself and Janet, I lay no special claim to it, considering it simply a modification of Dr. Halsted's nozzle, which was brought out by him twelve years ago.

We frequently irrigate the bladder without placing the patient on the operating tables, which are pictured in the BULLETIN, and no apparatus could be simpler than a glass percolator suspended on a pulley, which we use and which costs exactly 75 cents for the whole outfit.

The tank of sterile warm water is a "complication" which we deem very important where asepsis is to be practiced. The fact that cystitis has more than once been inaugurated by careless technique in giving bladder irrigations with weak antiseptics during gonorrhœa is sufficient justification for the greatest care. HUGH H. YOUNG.]

PROCEEDINGS OF SOCIETIES.

THE JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY.

Cocaine Anæsthesia in the Treatment of Certain Cases of Hernia and in Operations for Thyroid Tumors.— Dr. HARVEY W. CUSHING.

The following cases illustrate the great benefit which the use of cocaine affords the operator in dealing with certain conditions when the administration of a general anæsthetic is contraindicated.

Operative interference is oftentimes considered inadvisable in cases of hernia occurring in old people who may be suffering from chronic bronchitis, or in whom pronounced cardio-vascular changes render the administration of ether dangerous.

CASE I. **This patient is 67 years of age. He has had a large right inguinal hernia for 10 years, which was not controlled by a truss and which of late has frequently become incarcerated. He is suffering from chronic bronchitis and emphysema, which possibly had been responsible for the recent increase in size of the hernia and the attacks of incarceration. His radial arteries, as you may see, are tortuous and calcified, and there is a systolic murmur at the apex transmitted to the axilla. Two weeks ago to-day the hernia was operated on by the usual Halsted method, but under local anæsthesia. The patient suffered little pain and was sent back to the ward to have his dinner. This is the first dressing. The wound under the silver foil has healed, leaving only a fine linear cicatrix.**

Had it not been possible to make use of a local anæsthetic in this case an operation would hardly have been deemed advisable. It is a great relief to the operator to be free from the responsibilities connected not only with the administration of a general anæsthetic to an aged person, but also with the recovery therefrom. In all of these cases a preliminary hypodermic of morphia has been given. The skin at the proposed site of incision has been infiltrated with a weak Schleich's solution. Practically no further cocainization was necessary, which was fortunate, as the infiltration method is hardly applicable to the deeper structures. The patient suffered little pain, and then only during the ligation of vessels, when the internal oblique muscle was divided and when the deep silver mattress sutures were drawn up and tightened. The sac seems to have no sensory nerves worth considering, and it is well recognized that handling a non-inflamed bowel is free from subjective sensation on the part of the patient.

There is another condition of hernia in which the administration of a general anæsthetic is attended with risk. Patients with strangulated hernia are often in such a state of shock that one dreads the effect of etherization, especially when, as is not uncommon in these conditions, vomiting is a prominent feature. The speaker had an unfortunate experience a few months ago with such a case. The patient, an old blind syphilitic with a strangulation of twenty-four hours' duration, died under ether shortly after reaching the operating table. The autopsy revealed a gumma occupying each occipital lobe and advanced arterio-sclerosis. A cocaine operation would doubtless have been free from danger. Furthermore, in these cases it is almost impossible to foretell the condition of the strangulated bowel. The experience at this hospital seems to have been that in cases where resection and intestinal suture is found to be necessary, an immediate anastomosis is attended with a very high mortality. The cases which have recovered are largely those in which an immediate fæcal fistula has been established. The fistula may be closed some weeks later, when the patient's condition will enable him to stand an operation for intestinal suture better than when suffering from the shock of complete strangulation. Under cocaine anæsthesia it is a simple matter to open the sac and divide the constriction, and if the strangulated bowel is no longer viable the establishment of a fistula is a simple procedure. If the condition of the bowel allows of reduction, it is possible at times to complete the operation for radical cure at the time. If the patient's condition prohibits this, the external wound may be closed and a subsequent careful herniotomy performed under general anæsthesia.

CASE II. **This patient is 53 years of age. He had a large hernia for 30 years, which under a sudden muscular effort passed his truss and could not be reduced. He entered the hospital 34 hours later, distended, vomiting and in considerable shock. Obstipation was complete. There was a large tender tumor the size of two fists occupying the left groin and scrotum. The patient was given stimulants and morphia, and under cocaine anæsthesia the contents of the sac were liberated, proved viable and reduced. The sac was very thick, adherent, and was excised with some difficulty. The surrounding tissues were so indurated that little attempt was**

made to do more than roughly close the wound. There was immediate relief to all symptoms. He returned three weeks ago to have his hernia on the opposite side operated on, and at that time a more perfect plastic was made at the original site where there was evidently some weakness of the wall.

Case III. This colored man entered the hospital ten days ago with a six-hour strangulation. He was in great pain, vomiting and hiccoughing, with a tender pyriform tumor, the size of a fist, in the left groin. He was given morphia, and under cocaine the sac was opened, the constriction divided and a large dark loop of bowel proved viable and reduced. The patient's racial characteristics would not allow of further procedure, and as his condition was good, under primary chloroform anæsthesia the usual operation for radical cure was completed. This is his first dressing.

I was recently called upon to operate alone in the country for a strangulated femoral hernia of three days' duration in a rather feeble woman. The cocaine anæsthesia was most satisfactory, not only for operative purposes, but because the patient could be left alone without waiting for an ether recovery and feeding could be immediately begun.

There is another operation which is often attended with great risk, due to a general anæsthetization. That is thyroidectomy. Patients with enlarged thyroids proverbially take ether badly. The resultant cyanosis makes the operative field a bloody one, and a clean dissection is difficult. Furthermore, as Kocher pointed out in his original paper (Ueber Kropfextirpation und ihre Folgen, Archiv f. klin. Chir., Bd. XXIX, 1883), the tracheas of these patients are often distorted and flattened, so that manipulations of the tumor may completely obstruct respiration by flattening out the already narrow passage. A case was lost at this hospital a year ago from this very cause. A large goitre, when almost enucleated, was lifted partially from its bed, when respiration immediately ceased and all attempts to relieve the pressure and resuscitate the patient were unavailing. A few months ago the speaker had an unpleasant experience while operating upon an Irish setter for the removal of a large hemorrhagic cyst of the thyroid such as Bradley has lately described (Journal of Experimental Medicine, Vol. I, 1896). The animal took ether very badly, the operative field was very bloody, and respiration several times was seriously impeded. On removing the tumor the trachea was found very greatly flattened and pushed far from the median line.

Case IV. This man is 44 years of age. He has had a tumor of the thyroid for ten years, which lately had begun to embarrass his respiration so that he was unable to work. The left half of the thyroid with the tumor was removed a month ago. Shortly before the operation a quarter of a grain of morphia was given. The skin alone was anæsthetized, and the lobe of the thyroid was enucleated in the layer of reticular tissue just outside of that occupied by the large veins to the gland, so that comparatively few and only the large branches at some distance from the gland had to be ligated. The operation was practically bloodless. The large veins, many the size of a pencil, were divided between ligatures. The tying of these ligatures was the only thing which caused the patient pain. Manipulation of the tumor would frequently embarrass his respiration, but he would always give warning of this dyspnœa so that the method of attack could be changed. His chief complaint was of a smothered feeling, so that he had to be constantly fanned and given water to drink. The advantage of a dry and bloodless field was demonstrated at the end of the operation, when the recurrent laryngeal nerve was seen arching up through the last bit of tissue which held the tumor. Had the tissue been blood-stained it would doubtless have been divided. The trachea was quite flattened out and could be readily occluded by slight pressure between the fingers. His recovery was uneventful.

A Word of Warning as to the Indiscriminate Use of Cocaine in the Treatment of Diseases of the Eye.—Dr. Theobald.

I shall not present a paper, but merely make some observations, which seem to me not untimely, in regard to the indiscriminate use of cocaine in the treatment of diseases of the eye. It has come to be quite common for the general practitioner to use cocaine in eye inflammations, the inducement being that it diminishes the pain temporarily and so causes a measure of relief. The conditions in which it is used are various. I have met with many instances in which it was prescribed in simple catarrhal conjunctivitis. There seems to be no indication for its employment under such circumstances, and it is capable of doing much more harm than good, as I shall show by the history of several cases.

Because of its pronounced disturbing effect upon the nutrition of the cornea, cocaine is not a remedy to be used carelessly in eye diseases. It acts, as you know, through the sympathetic nerves, or chiefly in that way, and besides anæsthetizing the eye, it dries the cornea to a remarkable degree. Some authorities say this drying is due to the fact that, as the sensibility of the cornea is annulled, winking does not take place as usual, and so the cornea is not moistened by the action of the lids; but I am sure that this is not the correct explanation. For I have observed that, although the eye be kept closed during the application of cocaine (a precaution which is now usually taken), the cornea will sometimes become quite dry and lose its lustre very soon after the speculum is introduced. This never occurred in the days before we used cocaine, so I think there can be no doubt that the drying does not depend upon the mere lack of winking the lids, but is due to a marked disturbance of the corneal nutrition. Probably the contraction of the vessels of the conjunctiva, and possibly some more direct action of the cocaine upon the lymph spaces of the cornea, disturbs its normal supply of fluids. The result is that the cornea not only becomes dry, but the epithelium becomes loosened, so that it is easily rubbed off, sometimes by the friction of the lids, or from the slightest touch of the instruments being used. Any agent that has so marked an effect as this upon the nourishment of the cornea certainly seems not to be a safe one to use, unless there is a clear indication for its employment.

The field of usefulness for cocaine, apart from its anæsthetic action, is extremely limited. I scarcely think, indeed, there is any occasion to prescribe it as a remedy in eye diseases, though it may be used sometimes to increase the action of other drugs; for instance, atropia, or homatropia, will dilate the pupil more quickly and powerfully if combined with cocaine. Even here I prefer to keep the solutions separate, and to instill the cocaine first and then the atropia. It is also useful as preliminary to the application of astringents or caustics, like the sulphate of copper or nitrate of silver, as it greatly lessens the discomfort, but this is only another phase of its anæsthetic action.

I have picked out one or two rather striking examples of what may happen from its use in some of the conditions I have alluded to.

Case 1. Mr. H. had an acute catarrhal conjunctivitis. A 4 per cent. solution of cocaine had been prescribed for him, to be used every hour. After each instillation there had been a period of comfort, though the discomfort was not great previously; but after he had used the cocaine in this manner for some days he came to me with the central part of the cornea steamy and the epithelium considerably roughened. The nerve endings were thus exposed, and as soon as the temporary effect of each application of the cocaine had worn off he felt a great deal of pain and experienced much photophobia. It was simply a case of catarrhal conjunctivitis, and this unusual condition of the cornea was solely the result of the use of cocaine.

Ordinarily one would prescribe for such a conjunctivitis a weak solution of sulphate of zinc and boracic acid, but here we had to use atropia until the irritation of the cornea had ceased and then give boracic acid. After two or three days of such treatment I heard from him that the eye was rapidly improving.

Case 2. This case occurred only a few weeks ago. A school teacher had a catarrhal conjunctivitis which had lasted about four weeks. She had been using a solution of cocaine in rose water. The eyes were quite irritable and a conjunctivitis that should have gotten well in a very short time was getting worse, and might have persisted indefinitely under this treatment. I prescribed a lotion of opium to be applied over the lids, and a solution of sulphate of zinc and boracic acid to be dropped into the eyes, and in a few days she was well.

Case 3. A few days since I had another case, an acute inflammatory glaucoma, where the chief reliance had been placed on the use of cocaine. Temporary relief had been gained, but of course it had no remedial effect whatever, and its use was unfortunate because the physician was placing reliance upon something that had no effect other than to lessen the pain for a time.

I have thought it worth while to report these typical cases, because I am sure that it is getting to be a very common thing for the general practitioner to prescribe cocaine indiscriminately in eye diseases, and, as I feel that its field of usefulness is so limited, a word of warning upon this point seemed to me not amiss.

On the Pathology of Fragmentatio Myocardii and Myocarditis Fibrosa.*—John Bruce MacCallum.

The normal adult heart muscle consists of rhomboidal branching cells whose protoplasm is made up of fibril bundles separated by sarcoplasm. The fibril bundles possess a narrow striation called Krause's membrane, and a broader one known as Brücke's line. The sarcoplasm is divided into compartments or discs, whose horizontal boundaries are continuous with the narrow striations on the fibril bundles. These compartments have been called sarcoplasmic discs. The protoplasm of the cell then consists of a definite network made up of the fibril bundles and the membranes bounding the sarcoplasmic discs.

The earliest stage in the development of the cell shows an irregular network in the protoplasm. This tends to become more regular, giving rise to disc-like meshes. Some of these break up into smaller ones, and in the angles between them there is an accumulation or a differentiation of the substance of the network, giving rise to longitudinally disposed masses which become the fibril bundles. The discs left are the sarcoplasmic discs. This formation of fibril bundles takes place first at the periphery of the cell, so that the bundles last formed are those nearest the centre of the cell. It is thus probable that the network spoken of in the adult fibre is derived directly from the primitive network of the embryonic cell.

In the extended condition the structure of the fibre is somewhat different from that described. The cells are narrow; the Krause's membranes are further apart; the fibril bundles themselves are closer together; and the Brücke's lines are much more conspicuous than in the contracted muscle. These and some additional minor differences make it easy to recognize an extended fibre.

Fragmentatio Myocardii. In all severe cases of fragmentation there is an uneven extension and contraction of the fibres. Two adjacent cells may be in the states of extension and contraction respectively. Often on following a contracted fibre down to the cement line, one finds the cell on the other side of the cement line extended. This condition is often present also in the same cell, that is, one part of a cell may be extended, while another part is contracted. The breaks which accompany this condition may take place in the body of the cell or in the cement line. In the cell body the lesion is more severe in extended than in contracted muscle.

In addition to these simple breaks there is a definite degenerative process which leads to the disintegration of the part affected, and a consequent fragmentation of the fibre. The initial stage in this process is an extreme extension of the fibre. Following this there are irregularities produced in the rows of striations, and changes in the relation of the sarcoplasm to the fibril bundles. This irregularity increases until no definite arrangement of the fibril bundles can be made out. The fragments of the fibril bundles then gradually disappear. There is finally a complete disintegration of the part and a breaking of the fibre. For this process I propose the name sarcolytic degeneration.

The exact relation between this degeneration and the simple fragmentation is not clear. They occur together and are obviously closely related. The simple breaks do not differ from those produced mechanically. The degenerative fragmentation, however, seems to be a gradual process. It was found in practically all the cases examined, and was the most conspicuous lesion in each instance. Such a wide process of disintegration must throw much of the muscle out of function, and the extra work must be done by the remaining normal muscle. It is conceivable that this unusual strain might cause in the otherwise normal muscle such simple breaks as those described. If this be true the main lesion in fragmentation is the sarcolytic degeneration, while the simple breaks in the various

* Synopsis of a paper read before the Johns Hopkins Hospital Medical Society, to be published in full in the Journal of Experimental Medicine.

locations are the mechanical results of the unusual strain thrown on the muscle which remains undegenerated.

Myocarditis Fibrosa. In fibrous myocarditis the disappearance of muscle takes place by atrophy and degeneration of the cells. This degeneration is brought about by a definite process, which may be described in brief as follows: There is at first a marked increase in the undifferentiated sarcoplasm in the centre of the cell, accompanied by a disappearance of the fibril bundles there. This disappearance of fibril bundles increases until there is left only a single row around the periphery of the cell. These are gradually lost, and only the sarcoplasmic discs remain. The cell at the same time becomes small and somewhat spindle-shaped, and finally disintegrates entirely.

This process is interesting in connection with the histogenesis of the cell. The fibril bundles are formed first at the periphery of the cell, and develop towards the centre, so that those which are formed last are nearest the centre of the cell. As described above, however, it is these centrally placed fibril bundles which are the first to disappear. The degeneration proceeds from the centre out (centrifugally), while the development has occurred from the periphery in (centripetally). The earliest stage in the development is a spindle-shaped cell with simple sarcoplasmic discs, while the latest stage in the degeneration could be described in the same words. The process of degeneration is thus approximately a reversal of the process of development. The first structures formed are the last to degenerate, and the last to develop are the first to disappear.

NOTES ON NEW BOOKS.

Atlas of Legal Medicine. By Dr. E. von Hofmann, Professor of Legal Medicine at Vienna. Authorized Translation. Edited by Frederick Peterson, M. D., and Aloysius Kelly, M. D. (*W. B. Saunders, Philadelphia*, 1898.)

The first impression obtained in glancing over the highly colored lithographs of suicides and murders is that one has entered the "chamber of horrors," at Madame Tussaud's. A deeper insight shows more clearly the real value of the work from a scientific and medico-legal standpoint.

The first section, comprising malformations of the external organs of generation may be passed without comment, as similar pictures are to be found in a number of text-books on special departments of medicine.

Next in order follow the plates of various hymens, virginal and deflorated, the appearance of the os uteri, normal and pathological, uteri in the earliest stages of pregnancy, the lesions following instrumental and other forms of abortion, pictures of the degree of ossification of the epiphyses of the bones of full term and immature fœtuses, and the lungs of new-born infants. A very large and interesting section is devoted to illustrations of injuries of the skull bones, the hole fractures, so frequently met, claiming especial attention. Injuries of the lungs, brain and intestines are depicted in colored plates.

Injuries to the body inflicted in suicidal or murderous attempts, punctured wounds of the stomach, intestine and skull by different instruments, together with plates of gunshot wounds, occupy a considerable space.

Colored illustrations of suicides by hanging, burning, and other lethal means, the appearance of the body after several days' suspension by the neck, and the distribution of the hypostases and the appearance of the skin after long immersion in water, are all reproduced.

The best section of the book, as well as the one having the best plates, is devoted to the pathological conditions of the organs following intentional or accidental ingestion of the irritant poisons, concentrated and dilute acids, corrosive sublimate, caustic potash, potassium cyanide, arsenic and phosphorus. The gross pathological appearances of the stomach, liver, intestines and kidneys are faithfully depicted in natural colors, and this section is one of the most useful of the work.

The illustrations throughout the book are rather unequal in merit, and a number could have been omitted without detriment. The description of the plates and figures is freer from the idioms of the original language, than is ordinarily found in translations, and marks the careful supervision of the editors. H. J.

Report on Bubonic Plague: Being a report based upon observations on 939 cases of Bubonic Plague, treated at the Municipal Hospital for Infectious Diseases, at Arthur Road, Bombay, from September 24, 1896, to February 28, 1897. By Khan Bahadur N. H. Choksy, Extra Assistant Health Officer, Bombay Municipality. (*Reprint: Bombay*, 1897.)

Choksy's observations give us a clear and comprehensive idea of the nature of the fearful scourge that visited western India in 1896–7, and recurred with even greater violence in 1897–8.

Apart from the difficulties of properly caring for the patients brought to the hospital, the staff had to contend against the prevalent superstition in the minds of the patients' friends, who circulated rumors to the effect that patients were killed, their hearts removed and sent to the Queen in order to appease her wrath at the disfigurement of her statue in the city. A raid was finally made on the hospital by 1000 mill hands, who desired vengeance for the alleged killing. Several of the staff and patients were injured by stones thrown, and the mob was dispersed only after police interference. The death rate in the 939 cases observed was 73.26 per cent., or, excluding those who were brought in a moribund condition, 60.34 per cent. Mr. Choksy notes that the death rate was lower among the meat-eating patients than among the vegetarians. The clinical report is the most interesting and is very complete. Three types of the disease were found to be the most prevalent: (a) Pestis Simplex, (b) Pestis Septica (in which the blood is affected with the plague bacillus), (c) Pestis Pulmonalis, in which the lungs are primarily affected. This was at once the most insidious as well as the most infectious and the most fatal form of the plague. In Aoyoma's report of the Hongkong Plague (see J. H. Hospital Bulletin, Sept., 1896) but one case of pneumonia, as a complication, was recorded, while in Bombay it was of frequent occurrence, the most distressing symptom being dyspnœa, due to œdema of the lungs. In further contrast to the report of Aoyoma, Mr. Choksy's observations indicate that not more than 5 per cent. of the patients showed evidence of infection through breach of surface, in spite of the fact that most of the patients were accustomed to going barefooted and had many cracks in the soles of their feet. Pus from incised buboes, the sputum, and inspiration, are noted as methods of infection.

Almost every patient showed the typical *facies pestica*, a peculiar look of fright or sadness, which, together with the hesitating speech usually observed in plague patients, formed an important means of diagnosis.

55 (48 per cent.) of the buboes were in the femoral or femoro-inguinal regions, and in connection with these glandular swellings, lymphangitis was frequently observed. In the Hongkong epidemic, Aoyoma reports that this was a rare complication.

Choksy declares that "in no other disease is the disproportion in the normal ratio between pulse, temperature, and respiration so divergent." For instance, with a temperature of 105° the extremities might be icy cold, the pulse very quick, and so weak that it was often scarcely perceptible. Aoyoma, on the other hand, noted that plague patients usually showed a pulse of good volume. Serum therapy does not seem to have been very effective. Yersin's curative serum Choksy regards as having been a failure, and Dr. Haffkin's as only partially successful. Dr. Lustig's serum, however, gave good results in the few cases where it was tried, although the routine treatment of the hospital was always continued.

Fifty-four autopsies are reported, each case showing hæmorrhages in every conceivable and inconceivable part of the body.

A complete set of typical temperature, pulse and respiration charts is appended to the report.

THE JOHNS HOPKINS MEDICAL SCHOOL. SESSION 1898-1899.

FACULTY.

DANIEL C. GILMAN, LL. D., President.
WILLIAM H. WELCH, M. D., LL. D., Dean and Professor of Pathology.
IRA REMSEN, M. D., Ph. D., LL. D., Professor of Chemistry.
WILLIAM OSLER, M. D., LL. D., F. R. C. P., Professor of the Principles and Practice of Medicine.
HENRY M. HURD, M. D., LL. D., Professor of Psychiatry.
WILLIAM S. HALSTED, M. D., Professor of Surgery.
HOWARD A. KELLY, M. D., Professor of Gynecology and Obstetrics.
FRANKLIN P. MALL, M. D., Professor of Anatomy.
JOHN J. ABEL, M. D., Professor of Pharmacology.
WILLIAM H. HOWELL, Ph. D., M. D., Professor of Physiology.
WILLIAM K. BROOKS, Ph. D., LL. D., Professor of Comparative Anatomy and Zoology.
JOHN S. BILLINGS, M. D., LL. D., Lecturer on the History and Literature of Medicine.
ALEXANDER C. ABBOTT, M. D., Lecturer on Hygiene.
CHARLES WARDELL STILES, Ph. D., M. S., Lecturer on Medical Zoology.
ROBERT FLETCHER, M. D., M. R. C. S., Eng., Lecturer on Forensic Medicine.
WILLIAM D. BOOKER, M. D., Clinical Professor of Diseases of Children.
JOHN N. MACKENZIE, M. D., Clinical Professor of Laryngology and Rhinology.
SAMUEL THEOBALD, M. D., Clinical Professor of Ophthalmology and Otology.
HENRY M. THOMAS, M. D., Clinical Professor of Diseases of the Nervous System.
SIMON FLEXNER, M. D., Associate Prosessor of Pathology.
J. WHITRIDGE WILLIAMS, M. D., Associate Professor of Obstetrics.
LEWELLYS F. BARKER, M. B., Associate Professor of Anatomy.
WILLIAM S. THAYER, M. D., Associate Professor of Medicine.
JOHN M. T. FINNEY, M. D., Associate Professor of Surgery.
GEORGE P. DREVER, Ph. D., Associate in Physiology.
WILLIAM W. RUSSELL, M. D., Associate in Gynecology.
HENRY J. BERKLEY, M. D., Associate in Neuro-Pathology.
J. WILLIAMS LORD, M. D., Clinical Professor of Dermatology and Instructor in Anatomy.
T. CASPAR GILCHRIST, M. R. C. S., Clinical Professor of Dermatology.
ROBERT L. RANDOLPH, M. D., Associate in Ophthalmology and Otology.
THOMAS B. FUTCHER, M. B., Associate in Medicine.
JOSEPH C. BLOODGOOD, M. D., Associate in Surgery.
THOMAS S. CULLEN, M. B., Associate in Gynecology.
ROSS G. HARRISON, Ph. D., Associate in Anatomy.
REID HUNT, Ph. D., M. D., Associate in Pharmacology.
FRANK R. SMITH, M. D., Instructor in Medicine.
GEORGE W. DOBBIN, M. D., Assistant in Obstetrics.
WALTER JONES, Ph. D., Assistant in Physiological Chemistry and Toxicology.
SYDNEY M. CONE, M. D., Assistant in Surgical Pathology.
HARVEY W. CUSHING, M. D., Assistant in Surgery.
HENRY BARTON JACOBS, M. D., Instructor in Medicine.
HUGH H. YOUNG, M. D., Instructor in Genito-Urinary Diseases.
CHARLES R. BARDEEN, M. D., Assistant in Anatomy.
STEWART PATON, M. D., Assistant in Nervous Diseases.
NORMAN McL. HARRIS, M. B., Assistant in Bacteriology.
ALBERT C. CRAWFORD, M. D., Assistant in Pharmacology.
J. W. LATHAM, M. D., Assistant in Clinical Microscopy.
HENRY O. REIK, M. D., Assistant in Ophthalmology and Otology.
ELIZABETH HURDON, M. D., Assistant in Gynecology.
WALTER S. DAVIS, M. D., Assistant in Clinical Microscopy.
J. L. WALZ, Ph. G., Assistant in Pharmacy.

GENERAL STATEMENT.

The Medical Department of the Johns Hopkins University was opened for the instruction of students October, 1893. This School of Medicine is an integral and coördinate part of the Johns Hopkins University, and it also derives great advantages from its close affiliation with the Johns Hopkins Hospital.

The required period of study for the degree of Doctor of Medicine is four years. The academic year begins on the first of October and ends the middle of June, with short recesses at Christmas and Easter.

Men and women are admitted upon the same terms.

In the methods of instruction especial emphasis is laid upon practical work in the Laboratories and in the Dispensary and Wards of the Hospital. While the aim of the School is primarily to train practitioners of medicine and surgery, it is recognized that the medical art should rest upon a suitable preliminary education and upon thorough training in the medical sciences. The first two years of the course are devoted mainly to practical work, combined with demonstrations, recitations and, when deemed necessary, lectures, in the Laboratories of Anatomy, Physiology, Physiological Chemistry, Pharmacology and Toxicology, Pathology and Bacteriology. During the last two years the student is given abundant opportunity for the personal study of cases of disease, his time being spent largely in the Hospital Wards and Dispensary and in the Clinical Laboratories. Especially advantageous for thorough clinical training are the arrangements by which the students, divided into groups, engage in practical work in the Dispensary, and throughout the fourth year serve as clinical clerks and surgical dressers in the wards of the Hospital.

REQUIREMENTS FOR ADMISSION.

As candidates for the degree of Doctor of Medicine the school receives:

1. Those who have satisfactorily completed the Chemical-Biological course which leads to the A. B. degree in this university.

2. Graduates of approved colleges or scientific schools who can furnish evidence: (*a*) That they have acquaintance with Latin and a good reading knowledge of French and German; (*b*) That they have such knowledge of physics, chemistry, and biology as is imparted by the regular minor courses given in these subjects in this university.

The phrase "a minor course," as here employed, means a course that requires a year for its completion. In physics, four class-room exercises and three hours a week in the laboratory are required; in chemistry and biology, four class-room exercises and five hours a week in the laboratory in each subject.

3. Those who give evidence by examination that they possess the general education implied by a degree in arts or in science from an approved college or scientific school, and the knowledge of French, German, Latin, physics, chemistry, and biology above indicated.

Applicants for admission will receive blanks to be filled out relating to their previous courses of study.

They are required to furnish certificates from officers of the colleges or scientific schools where they have studied, as to the courses pursued in physics, chemistry, and biology. If such certificates are satisfactory, no examination in these subjects will be required from those who possess a degree in arts or science from an approved college or scientific school.

Candidates who have not received a degree in arts or in science from an approved college or scientific school, will be required (1) to pass, at the beginning of the session in October, the matriculation examination for admission to the collegiate department of the Johns Hopkins University, (2) then to pass examinations equivalent to those taken by students completing the Chemical-Biological course which leads to the A. B. degree in this University, and (3) to furnish satisfactory certificates that they have had the requisite laboratory training as specified above. It is expected that only in very rare instances will applicants who do not possess a degree in arts or science be able to meet these requirements for admission.

Hearers and special workers, not candidates for a degree, will be received at the discretion of the Faculty.

ADMISSION TO ADVANCED STANDING.

Applicants for admission to advanced standing must furnish evidence (1) that the foregoing terms of admission as regards preliminary training have been fulfilled, (2) that courses equivalent in kind and amount to those given here, preceding that year of the course for admission to which application is made, have been satisfactorily completed, and (3) must pass examinations at the beginning of the session in October in all the subjects that have been already pursued by the class to which admission is sought. Certificates of standing elsewhere cannot be accepted in place of these examinations.

SPECIAL COURSES FOR GRADUATES IN MEDICINE.

Since the opening of the Johns Hopkins Hospital in 1889, courses of instruction have been offered to graduates in medicine. The attendance upon these courses has steadily increased with each succeeding year and indicates gratifying appreciation of the special advantages here afforded. With the completed organization of the Medical School, it was found necessary to give the courses intended especially for physicians at a later period of the academic year than that hitherto selected. It is, however, believed that the period now chosen for this purpose is more convenient for the majority of those desiring to take the courses than the former one. The special courses of instruction for graduates in medicine are now given annually during the months of May and June. During April there is a preliminary course in Normal Histology. These courses are in Pathology, Bacteriology, Clinical Microscopy, General Medicine, Surgery, Gynecology, Dermatology, Diseases of Children, Diseases of the Nervous System, Genito-Urinary Diseases, Laryngology and Rhinology, and Ophthalmology and Otology. The instruction is intended to meet the requirements of practitioners of medicine, and is almost wholly of a practical character. It includes laboratory courses, demonstrations, bedside teaching, and clinical instruction in the wards, dispensary, amphitheatre, and operating rooms of the Hospital. These courses are open to those who have taken a medical degree and who give evidence satisfactory to the several instructors that they are prepared to profit by the opportunities here offered. The number of students who can be accommodated in some of the practical courses is necessarily limited. For these the places are assigned according to the date of application.

The Annual Announcement and Catalogue will be sent upon application. Inquiries should be addressed to the

REGISTRAR OF THE JOHNS HOPKINS MEDICAL SCHOOL, BALTIMORE.

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